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Schiess Machine Tool Works of Düsseldorf

Building Upright Boiler Plate Bender and Automatic
Cutter Disk Grinder—Uncertainty in Situation
by Reason of Ruhr Occupation

BY CAPT. GODFREY L. CARDEN

REPRESENTATIVE of the best in German heavy tool building, the machine tool works of Ernst Schiess, known as Ernst Schiess Werkzeugmaschinenfabrik Aktiengesellschaft, is located in Düsseldorf. I reported on this plant in 1908 for the Department of Commerce and recently re-visited the place to note the changes since the World War. When General-Director M. Koyermann took me through the shops I was impressed at once with the development and extension which had been effected since I was last there. The same general line of work is carried on as in former years, but buildings have been extended and increased in number, and the output capacity greatly increased.

The company employs today about 2000 men, or double the number of pre-war days. There is plenty of work in hand for export, but conditions on the Rhine are now affected by the French occupation of the Ruhr, and the future outlook for these shops, in common with other German industries of like character in the Düsseldorf district, is uncertain. Given a free hand, and there is little doubt that Schiess products would be finding an outlet across seas in as great proportion as before the war.

In the meantime alterations and changes are being carried on in the plant which could not be conducted during a period of large productivity. This will put



Main Erecting Shop, Showing Record Punching Machines in Process of Assembly

the works in first class shape to go ahead whenever the political situation clears up.

The firm produces practically all its own castings, and pieces up to 50 tons are readily cast. The principal tools built in the shops comprise heavy duty lathes, planers, boring, drilling, shaping and slotting machines, tools for boiler making, rolling mills, and for locomotive shops, wagon works and arsenal machinery. Krupp of Essen has drawn largely on Schiess, and the majority, I would say, of arsenal tools in the Essen shops prior to the war and during it were of this plant's construction. There is no tool too large for Schiess to build. His prices have always afforded sharp competition with American builders of heavy tools, but he has been beaten in the matter of deliveries when the question of delivery was of paramount importance.

Prior to the war Schiess operated a branch plant at Riga, but I learn that this establishment passed out with the war. Just now the noteworthy tools which the Düsseldorf plant is building are a reconstructed heavy duty double bed lathe designed for rapid work on turbine motors, crankshafts, gun and general forgings and marine shafting; a new tire boring mill for railroad trucks and the smaller size locomotive tires; a new profiling tool rest for railroad wheels; a "record" punching machine for curved and rectangular plates; a vertical bending press for use particularly in marine boiler work, and an automatic cutter disk grinding machine.

Schiess has been building a heavy duty double bed lathe for many years, but his present design carries with it a number of improved features. It is a massive machine and highly creditable. With the new tire mill it is possible to machine 16 to 18 tires of approximately 33½-in. inside diameter every 8-hr. shift. This machine is designed to handle tires from 27½ to 43½ in. inside diameter, with a diameter of faceplate of 65 in. The horsepower required varies from 25 to 30, with revolutions per minute from 500 to 1250 for variable speed d.c. motor, and 1000 revolutions for constant speed motor. The net weight of the machine is 30½ tons.

The new profiling tool rest was produced to meet a demand for the automatic turning of the profiles of railroad wheels, and to render the work independent of the skill of the operator. Designs for this accomplishment have as a rule proved too delicate or complicated, or have not been sufficiently accurate in work. The principal difficulty was to accurately turn the flanges. In the Schiess device the grinding mechanism is subjected to negligible pressure, which assures accuracy. The axis of the tools is always at right angle to the contour of the tire.

Machine for Accurate Punching

One of the heaviest outputs in numbers during the war, the "record" punching machine was an important addition to ship construction work. The Schiess machine will handle curved plates of any form, the machine punching with holes spaced at any regular or irregular pitches, without the necessity of employing formers or other devices. The gap punching and the multiple punching machines have held the field despite many drawbacks, to say nothing of the number of men required to handle them, the former machine largely because of ability to punch how and where required, and the later machine because suited to deal with rectangular plates with uniform pitch of holes. The Schiess record machine punches throughout the working day 850 holes per hour. The work done is claimed to have accuracy greater than with other types, since in the case of the gap machine much depends not only on the plater but on the remainder of the gang, whose combined efforts are required to move the plate from mark to mark.

The "record" punching machine comprises the punch-

ing machine proper, with operator seat, punches and dies cross traversing over a width of 7 ft. 2 in., and the roller transporter, in two parts, for feeding the plates longitudinally under the punches. All features of the gun train are in evidence in this design. The roller transporter is actuated by an independent motor, while a second motor actuates the cross traverse of the operator and tools. The operator controls the motor from his seat, which is carried on the cross slide by a simple manipulation of levers similar to those on a Morse telegraph instrument.

The plate can be brought under the punches with the greatest exactitude and rapidity. This is done with celerity. The center finding attachment, which locates the point for punching, consists of two inclined projectors each carrying a small metallic filament lamp. These lights throw a sharply defined and brilliant + on the plate, the intersecting point of which is always exactly under the center of the punch, no matter whether the plates are flat or of varied thickness. This patent center finder is especially valuable when used on dark days or in gloomy shops.

Driving through gearing, an independent motor operates the punching mechanism. A claw clutch which disengages after each stroke enables the punch to return automatically to its upper position. The dies are simultaneously lowered so that they are not blunted by the plate traversing over them. Punch and die holders are mounted to the extremity of a U-shaped frame, which is carried in long guides and of sufficient depth to clear the greatest width of plates. Die and die holder are lowered at the completion of each stroke. The punchings or burrs are automatically spilled into a receptacle on the side of the machine. Lubrication of the punches is automatically effected at each stroke.

Upright Boiler Plate Bending Machine

The upright boiler plate bending machine was designed to take care of certain disadvantages in the three-roller plate bending machine. One of these disadvantages consisted in the plate not being bent at all at its ends, due to the center distance of the bottom rolls, as shown in one diagram. Another disadvantage was the difficulty of checking the final shell diameter, as the distortion caused by its overhanging weight, especially with large diameter shells, is considerable.

Vertical plate bending machine			
	S. K. P.	1 S. K. P.	2 S. K. P.
Thickness of plates capable of bending.....	1¼ in.	1½ in.	2 in.
Maximum width of plates capable of bending....	13 ft.	13 ft.	13 ft.
Tensile strength of material which can be negotiated (tons per sq. in.)	29*	29	29
Power required for main motor (hp.)	40 to 45	55 to 60	75 to 80
Speed of main motor....	1000 r.p.m.	750 r.p.m.	750 r.p.m.
Power required for motor actuating top tension member (hp.)	4	5	6
Speed of top tension motor	1000 r.p.m.	1000 r.p.m.	1000 r.p.m.
Weight of machine in tons	50	60	68

*Equivalent to 65,000 lb. per sq. in.

To overcome the latter disadvantage, bending machines with vertically arranged bending rolls were introduced, but this arrangement it was found could not compete with the higher efficiency and greater convenience of the boiler plate bending press.

Schiess has brought out a motor-drive press in contradistinction to the hydraulically operated press, which latter for years has been familiar in most shops. The hydraulically operated machines counted as difficulties leakage of pressure at the motor, and the necessity of avoiding temperatures below freezing. The principle of the Schiess machine is seen in a second diagram. The accompanying photographs show front

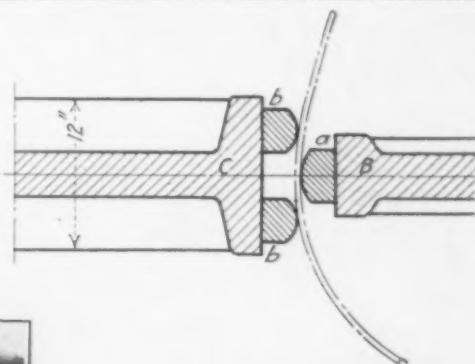
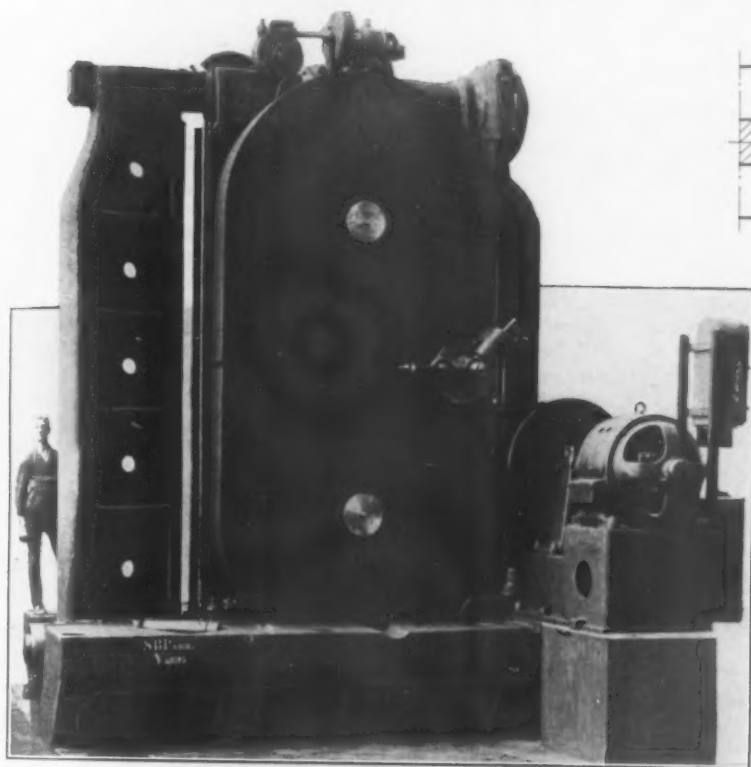
and rear views of the machine. From the diagram and the other illustrations it will be seen that there are a powerful main frame *A* of cast iron, and two tension members *b* of forged steel, which serve to hold in place the strongly constructed stationary cross-beam *B* of cast steel. Reciprocating and arranged between *A* and *B* is the strongly ribbed girder *C*, also made of cast steel.

Passage of the shell plate through the machine is

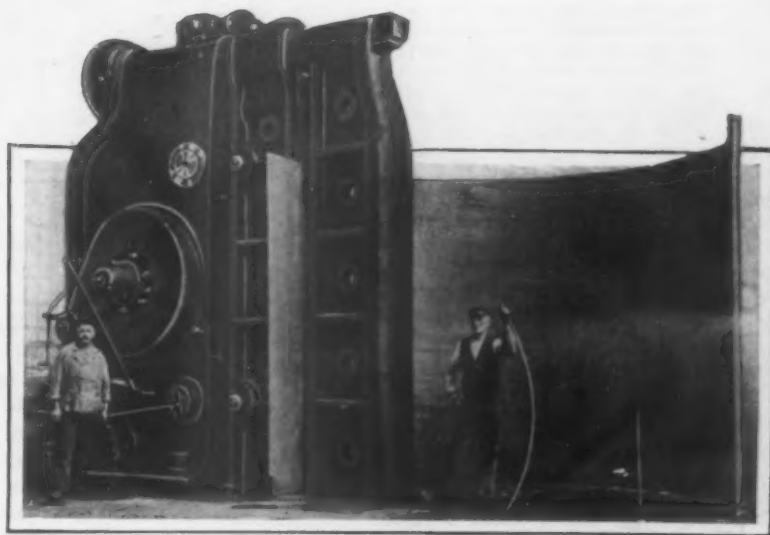
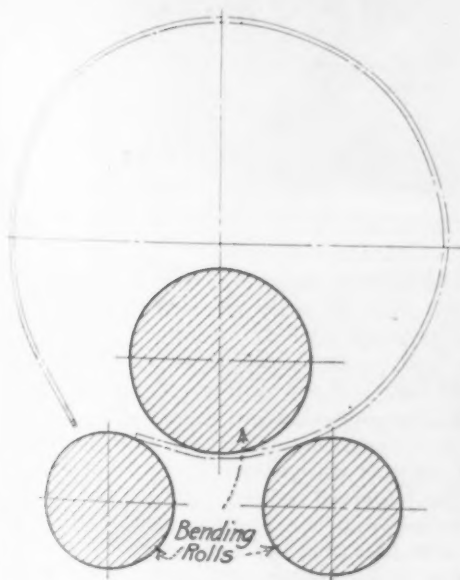
valves, no freezing of hydraulic pipes and that it is always ready for use.

Automatic Cutter Disk Grinder

The company has brought out a new automatic cutter disk grinder designed to handle cutter disks from 10 in. up to 55 in. in diameter. Different types of cutter disks are shown in two accompanying figures. The simplest disk shown can be used only for surfac-



Two Views of the Vertical Boiler Plate Bending Machine, Showing Method of Handling a Plate on Rollers Set into the Floor. In the diagram below is shown the old method of using bending rolls, and the lack of a proper bend at the edge of the plate. The other diagram illustrates how the new machine works, *C* being the girder attached to the main frame, *B* the stationary cross arm and *b, b* the two cast steel tension members



progressive and automatic. To reduce friction, the plate is carried along on roller bearings arranged on either side at the base of the machine. On its top side the machine carries the motor and gearing actuating the top tension member, which, for the purpose of lifting out the finished plate cylinder, is turned into a vertical position. Details of three sizes of this machine are carried in the table.

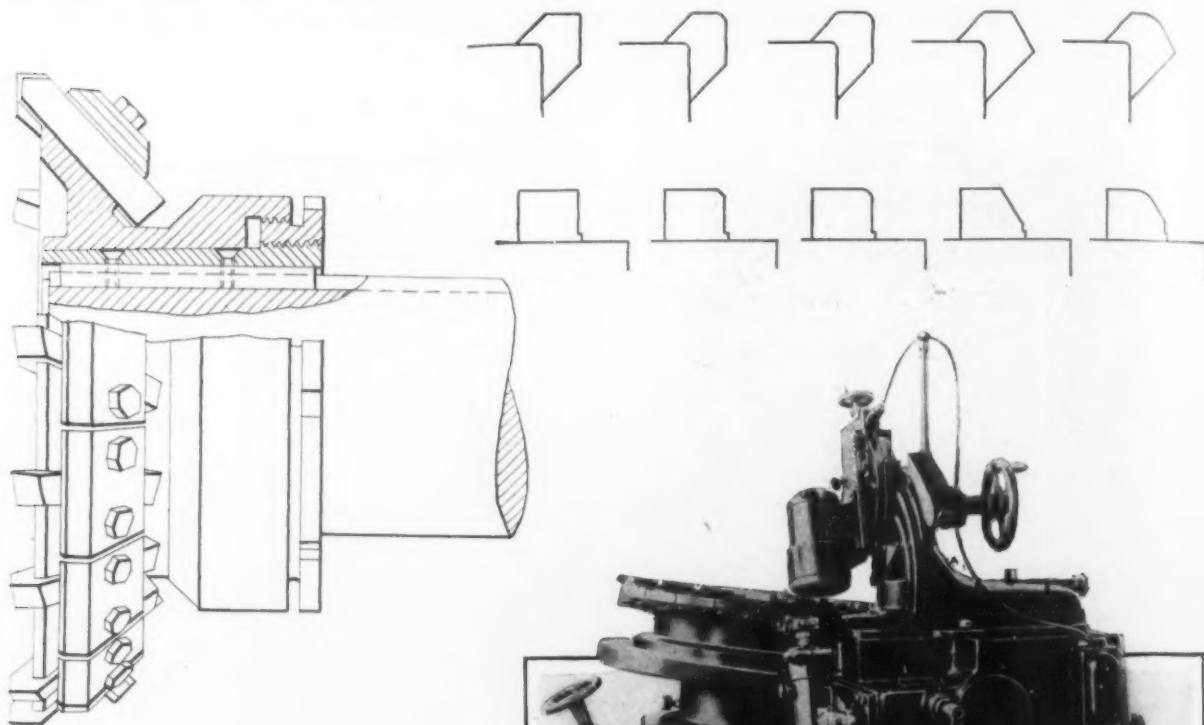
Among the advantages of the machine are claimed to be greater number of strokes per minute and therefore greater production, no leaking of pistons or

ing. In the other we have a disk suited for facing as well as boring, the difference between the two being the position at which the cutters are set. The latter, in different variations, is used in preference to the former, on account of the facilities afforded by the inclined position of cutters, which makes it possible to machine close up to the shoulders and projections of castings. There are many different methods of attaching the cutter head.

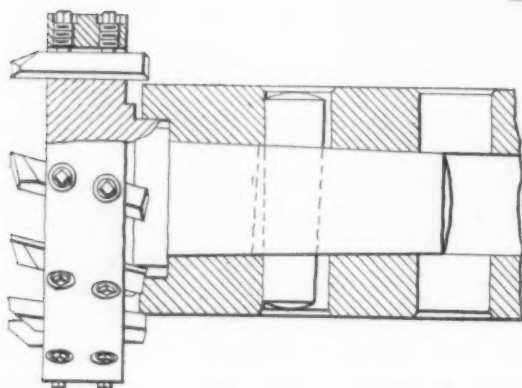
Under general present practice for re-grinding worn down cutters, the cutters are removed from the

head and re-conditioned on ordinary grinding machines. Not only is there a loss, it is pointed out, in both time and efficiency, but frequently the cutters on being replaced will show a want of concentricity, and when put to work will share unevenly in the cutting strain. The result is a proportional decrease in actual cutting efficiency. To obviate this shortcoming, the new automatic

clined rake of cutting edges. The grinding saddle carries a cup-shaped abrasive wheel which is fixed on the shaft of a small and entirely inclosed electric motor. It can be slewed over a semi-circular path and can thus be set to any angle desired for grinding the outside cutting edges. By slewing the saddle, tool corners may be rounded off at will. One diagram shows



Grinding Cutter Disks from 10 In. to 55 In. in Diameter, the New Automatic Grinding Machine Has Swivel Grinding Head with Inclosed Motor Mounted on the Grinder Arbor. Cutters are ground without removal from the head, thus maintaining alignment. Two details of cutter heads are shown, one carrying the cutters axially, while the other has cutters at an angle and is attached to the boring bar through a differential threaded ring and a tapered sleeve. Some of the tooth forms handled on this machine are also shown above



cutting disk grinding machine aims to re-grind the cutters without their removal from the holders.

With cutter disks not larger than 10 in. in diameter, ordinary milling cutter grinders may be used, it is recognized, to advantage, but for disks above that size there is need of a special grinder. The new Schiess cutting disk grinder possesses a hollow spindle and a removable face plate. The grinding table traverses horizontally and vertically and has an inclined position so as to facilitate the grinding of the inside in-

different shapes of cutting edges produced on the new grinding machine. The accuracy of grinding is independent of any irregular pitching of cutter blades.

Though the new grinder works entirely automatically, any and all stages of the work can be hand-operated, if desired. For centering the cutter disk on the face plate, the spindle can be made to turn freely, the other motions remaining stationary.

The writer has observed Schiess tools not only in Germany, but in many of the leading manufacturing plants of other countries, and has been impressed with the high character of the products of this firm. Apart from the good workmanship on the tools, there is probably no better casting work in Germany than can be found in this foundry.

In common with all German machine tool plants, this one is now facing a critical period, since all must suffer from lack of raw material. Coal and coke are scarce; pig iron is dear and only with great difficulty to be had. By the Versailles Treaty Germany retained the machine tool industry, but lost to France and Poland a great part of the raw material works. All this has been accentuated by the Ruhr occupation, and added to the foregoing is the seriousness of the food

situation. The effect of the latter is disastrous to the workmen and prevents concentration on work in hand. Export licenses are demanded of all Rhine machine tool works and these licenses, it is declared, are obtainable only when the prices calculated in foreign currency are about equal to pre-war gold mark prices.

In general, German machine tool types are today based on the application of high-speed cutting tools. Since the close of the war American stellite has been introduced, but it is yet too early to determine how far this will affect the future construction of German machine tools.

SHEET STEEL MAKERS

Human Relations Featured in First Day's Discussion at Executives' Convention

WHITE SULPHUR SPRINGS, W. VA., April 17.—With an attendance of 56 representing 95 per cent of the independent industry, the first annual convention of executives of sheet steel manufacturing plants opened here to-day at the Greenbrier Hotel to last over Thursday. The program of today dealt with administration, and one of the outstanding features was the emphasis laid on development of still closer human relations between employers and employees.

The convention was opened by Walter C. Carroll, vice-president Inland Steel Co. and chairman of the general convention committee, who greeted the delegates and read letters from men in the trade who were unable to be present, including President George M. Verity, American Rolling Mill Co., and Chairman Charles M. Schwab, Bethlehem Steel Corporation.

President W. S. Horner, of the National Association of Steel and Tin Plate Manufacturers, sounded a general note of the convention when he said he saw no cloud on the business sky. He gave an extremely interesting figure picture of the "sheet industry," his subject, pointing out that sheets represented 13 per cent of the finished output of last year and stood third upon the list of products produced, being outranked only by bars, shapes and tubing.

President William A. Follansbee, Follansbee Brothers Co., in speaking on "the need and respect for company policies," declared that there is nothing more important in the industry than cultivation of an understanding with labor, and urged company policies to this end. A largely similar tone was adopted by President A. M. Oppenheimer, Apollo Steel Co., who talked on "Human Relations" and said they are necessary to counteract radical tendencies. President George Bartol of the Otis Steel Co., speaking on "Executive Responsibilities," said he favored executives' taking responsibilities in handling labor rather than the committee plan.

President Severn P. Ker of the Sharon Steel Hoop Co. was optimistic in his remarks on "general forecast of business," but criticized restrictive legislation affecting the labor supply and other problems vital to industry. He declared that the sheet industry is entering upon a further great growth and predicted that the entire steel production of the country will reach 60,000,000 tons before 1930. He also said business must take a more active interest in legislative matters in order to protect itself.

Youngstown Sheet Mills Well Supplied with Orders

YOUNGSTOWN, April 16.—Sheet makers have well filled order books, and while premium prices have applied on small-lot sales, for which delivery concessions were offered, contract business has moved at lower levels. Most of the black sheet tonnage now being rolled was contracted for at 3.85c. per lb. Small lots, ranging up to several hundred tons, have brought from 4c. to 4.10c.

On galvanized sheets recent sales have been made in the Pittsburgh district at 5.50c. base, one transaction involving 400 tons. Quotations up to 5.60c. are noted, but the bulk of the galvanized tonnage is moving at a much lower figure, ranging from 5c. to 5.25c. Leading makers sold for the quarter some time

ago all grades of sheets at levels below the prevailing maximums. Most of the galvanized output of the district is contracted for and little surplus tonnage is available.

It is not unlikely that wire nails will shortly be advanced to \$3.25 per base keg. Demand, accelerated by the requirements of the building industry, is very firm. There are also indications that there will be an adjustment in pipe prices.

Merchant bar interests are well obligated and are operating at a capacity rate. Large pipe, going to the oil fields, is in less urgent demand due to the break in crude oil prices.

District interests continue hopeful of good business throughout the year, offsetting the losses encountered in 1921 and 1922.

Wage Increases

More than 2000 employees of the Central Iron & Steel Co. and the Harrisburg Pipe & Pipe Bending Co., both of Harrisburg, were affected by wage increases, effective April 16. These increases are along the line of those instituted recently by the United States Steel Corporation and other large steel companies.

All employees of the Harrisburg Pipe & Pipe Bending Co. are affected by the increases, which approximate 13 per cent, according to the general manager, E. C. Frey. H. S. Evans, general manager of the Central Iron & Steel Co., says that laborers get a 13 per cent increase, while the scales of all other employees were readjusted.

Two other Harrisburg companies will announce increases soon. One is the Lalance & Grosjean Mfg. Co. The Harrisburg Foundry & Machine Works expects to announce increases during the present month, although it has granted increases to all employees during the last several weeks.

Day rates of workmen of the Middletown Car Works, Middletown, Pa., a subsidiary of the Standard Steel Car Co., Pittsburgh, have been increased by 10 per cent, retroactive to April 1. Piece workers' rates will remain unchanged for the present. The Standard Steel Car Co. is now working on an order for 30,000 steel railroad cars.

About 6000 men employed by the Bethlehem plant at Sparrows Point, Md., will receive increases in pay as a result of the general increase announced recently by Eugene G. Grace, president.

About 2000 men employed by the Eastern Rolling Mills and the Baltimore Tube Co., Baltimore, will be given increases of approximately 12 per cent.

The exhibit of the products of the leading manufacturing companies of Middletown, Ohio, which was installed in the basement of the Hotel Manchester, that city, at the time of the recent meeting of the National Conference of Business Paper Editors, is to be a permanent exhibit. A few days ago all the school children in Middletown were taken through the exhibit under the guidance of their teachers, and the products were carefully explained.

The St. Louis Coke & Chemical Co., Granite City, Ill., has ordered a 120-ton hot metal car from the M. H. Treadwell Co., which will be used for carrying molten iron to the steel works of the National Enameling & Stamping Co.

CHAIRMAN TOPPING'S VIEWS

Not Probable Steel Production Will Be Increased —Annual Meeting of Republic Company

John A. Topping, chairman of directors of the Republic Iron & Steel Co., speaking of market conditions and production of steel at the annual meeting held last week, made the following statement:

"The iron and steel market from the standpoint of demand is in excellent condition. Prices based on THE IRON AGE's composite price April 5 of \$56.20, are about 33 per cent below the peak of 1920, and as related to costs are comparatively low. Advance in labor taking effect April 16 will bring our labor costs to within 20 per cent of the peak of 1920.

"Production of steel ingots for March, 1923, was at the record rate of approximately 45,000,000 tons a year for the country as a whole, and about equal to peak production attained in March, 1920. The record year of steel production was 1917, when the total steel ingot output reached 43,619,200 tons. The theoretical steel ingot capacity of the United States is about 55,000,000 tons; the practical capacity is probably close

to 50,000,000 tons. Measured by the practical capacity, the annual rate indicated by the March output is about 90 per cent; in other words, the present rate of production is close to maximum capacity, and it is extremely doubtful whether it can be maintained, as the demand for labor is increasing due to the general activity in building and all other trades.

"Under these conditions, it is not probable that the steel output will be increased. Any further advance in demand would only mean an increased shortage in supply of steel, as the mills generally are now several months behind on orders. In consequence of this demand, with increasing costs, prices are rising.

"Reported earnings for first quarter are substantially in excess of the preferred dividend requirements, and the prospects are that the report for the period ending March 31 will make a satisfactory showing.

"Funds are now in hand to carry out the building program outlined in the annual report. Directors, however, have decided that it will not be practical or advisable to complete the entire program during 1923, on account of labor and other conditions.

"The more important work will be completed this year, and the less urgent part deferred until later."

Retiring directors were re-elected.

RELIEF FAR DISTANT

General Revision of Tax Laws by Next Congress Is Not Probable

WASHINGTON, April 17.—Tax revision at the next session of Congress appears to be altogether improbable. The statement announced last week by Secretary of the Treasury Mellon, showing that income tax collections for the calendar year 1922 received in March had exceeded estimates, led him to renew a previous suggestion that the surtax rate might well be decreased from the present 50 per cent to 25 per cent. The fact that revenue from the Fordney-McCumber tariff act is averaging \$2,000,000 a day and also is in excess of estimates had given added hope that attempts would be made by the administration for a downward revision of taxation at the next session of Congress.

Business interests of the country had responded favorably to the suggestions of the Secretary of Treasury that surtaxes now assessed are an undue burden on them, and that a reduction would have a further stimulating effect on industrial activities and the country generally. But it has become evident that this hope will not be realized at the next session of Congress. As a matter of fact, President Harding is understood to believe firmly that, even if there were any reductions in taxes, they should not be confined merely to surtaxes, but should be general in character, affecting the normal as well as the higher taxes.

The views of neither the Chief Executive nor Secretary Mellon, however, appear to be the same as those of the leading members of Congress who will have charge of revenue legislation at the next session of Congress. These include Senator Reed Smoot of Utah, who probably will be chairman of the Committee on Finance; Representative Green of Iowa, who will be chairman of the House Committee on Ways and Means, and Representative Madden of Illinois, chairman of the Committee on Appropriations. All of these members of Congress discussed revenue legislation with the President last week. Their opposition to taking the question up at the next session of Congress apparently is shared generally with other conservative members of Congress.

Senator Smoot even thinks that an attempt to revise the administrative provisions of the revenue law, as has been suggested by Representative Green, would be useless. This reflects another of the various differences of opinion on the subject of tax legislation, as shared by supporters of the administration themselves. They do not take the form of sharp disagreements, but merely a frank variance of views.

In view of the opinions expressed by the leaders of Congress, it is believed that a general revision of

tax laws is not likely to be undertaken with success until March, 1925, with the advent of a new Congress after the next Presidential election. In the event revenues have increased in the meantime and business conditions continue in their present healthy state, it is believed that downward revisions may be expected throughout.

Contracts for Wheeling Filtration Plant

Contracts for the equipment for the new filtration plant for the city of Wheeling, W. Va., have been awarded as follows:

Contract and Successful Bidder	Price
Intake pier, suction pipe and tunnel—John F. Casey Co., Pittsburgh	\$481,500
Pump station and filter plant superstructure—Engstrom & Knapp, Wheeling.....	184,130
Elevator for filter plant and pump station—Otis Elevator Co., New York.....	11,760
Heating boilers—Bartley, O'Neill & Co.....	4,240
Pump station piping—Pitt Construction Co., Pittsburgh	33,000
Filter equipment—M. L. Bayard & Co.....	93,700
Steel filter wash tank—Chicago Bridge & Iron Works	9,500
Filter plant conveyor system—Stephens-Adamson Co.	9,470
Excavation and foundations, reservoir tanks—Pittsburgh-Des Moines Steel Co.....	42,900
Reservoir tanks—Pittsburgh-Des Moines Steel Co....	95,330
Force mains—Pittsburgh-Des Moines Steel Co.....	445,255
Cast iron pipe—U. S. Cast Iron Pipe & Foundry Co....	119,907
Gate valves—Ludlow Valve Mfg. Co.....	40,562
Check valves—Michigan Valve & Foundry Co.....	4,162
Air relief valves—Ludlow Valve Mfg. Co.....	1,162
Hydraulic plug valves—Michigan Valve & Foundry Co.....	2,072
Fire hydrants—Ludlow Valve Mfg. Co. (each).....	57
Sluice gates—Caldwell Wilcox Co.....	6,449

Bedford Foundry & Machine Co. submitted a price of \$5,995 for 10-ton, 39-ft. 8-in. span, 3-motor, floor controlled crane, the Whiting Corporation \$6,350 and the Champion Engineering Co. \$6,690, but no award was made, since the lowest bidder failed to furnish full detailed specifications.

The Imperial Steel Co., Collingwood, Ont., put into successful operation its new galvanizing department, which increases the capacity of the company's mill by some 80 tons of wire per day. The new plant was designed by Col. J. A. Currie, president of the company, and is a new departure in galvanizing wire continuously.

An additional hot mill was placed in operation on April 16 by the Lalance & Grosjean Mfg. Co., Harrisburg, Pa., which recently resumed operations after having been closed for a month because of inability to obtain raw material. Seventy men are employed in the mill just reopened.

Birmingham and Low Cost Steel Production

Raw Materials Most Cheaply Assembled There and Water Outlets Give Most Advantageous Access to World Markets

BY Y. A. DYER*

IN the serial articles relating to "Foreign and Domestic Pig Iron Costs," by Paul M. Tyler, published in Feb. 15 and Feb. 22 issues of THE IRON AGE, there is much food for serious thought as to the future status of the United States as a competitor in the iron and steel markets of the world.

Mr. Tyler expounds sound economic doctrine when he says: "Other things being equal, the country that can produce the cheapest pig iron has the advantage over its competitors throughout the whole range of heavy steel products." And further: "It is hard to conceive of a large industry (steel) being maintained indefinitely for the production of heavy tonnage products (steel) by means of a cold pig process."

Comparative Assembling Costs

Mr. Tyler indicates the keystone of the arch supporting the future iron and steel industry when he says: "The country that produces pig iron most successfully in competition with its foreign rivals must be able to assemble coke, ore and fluxes of suitable quality at its furnaces more cheaply than these elements can be assembled at rival stacks."

This, of course, means that metallic iron is the unit sought; and, regardless of the richness of iron ore used, its total cost per unit at furnaces will control initial competitive production, also step operations, and regulate the distance to which the products may be shipped in successful competition.

As indicated by Mr. Tyler, the typical high-grade iron ore used in the Middlesbrough, England, district is the Rubio Spanish hematite, of approximately 50 per cent iron value, costing \$5.10 per ton delivered at plants. This price is the practical equivalent of merchant Lake ores delivered in 1922 at lower Lake ports for rail distribution to the Eastern and Middle Western furnaces of the United States. With this ore cost as a comparison, Mr. Tyler sounds a note of warning as to the large potential resources of English phosphoric ores—similar in character to the enormous deposits in the Birmingham, Ala., district—and characterizes them as "Britain's trump card in the international iron and steel trade," linked with her formidable juxtaposition in regard to fuel supply, compared with European or with Eastern and Middle Western industrial centers in the United States.

Alabama a Most Important Factor

To substantiate his comparison of these vital factors, there was supplied a graphic chart of pig iron costs in the eastern United States, Great Britain, Lorraine and Belgium. While this chart of comparative iron costs is interesting and illuminating, to my mind it does not give the whole story, for it omits the greatest potential iron and steel factor in the United States, which may be cited as more than a balance to offset the enormous potential advantage ascribed as accruing to Great Britain in the "laying of her trump card." Therefore, to make the exhibit more comprehensive in this respect, there are submitted herewith tabulated costs for 1923, including the Birmingham district, the other figures being those given in Mr. Tyler's chart.

The lowest figure shown on Mr. Tyler's chart was the 1911 cost of Lorraine basic-Bessemer iron, \$9.70 per ton. In 1911-12 the cost of Birmingham basic and foundry irons, produced from high-grade self-fluxing red ores, was in the neighborhood of \$9.50 per ton. Great Britain's 1912 cost of acid Bessemer

iron was \$15.85 per ton. Therefore, while these two last named figures represent an increase of 30.60 per cent for Great Britain and 70.2 per cent for Birmingham (comparing 1923 and pre-war costs), today's comparison of total cost shows \$4.35 per ton in favor of Birmingham. And for Great Britain to recede to the use of the equivalent of Birmingham, Ala., phosphoric iron ores, compared with the standard Spanish ore now used, will mean at best an increased cost of fuel per ton of iron produced and other contributory costs equal to the Birmingham differential.

Water Outlet for Birmingham

For the sake of argument, grant that many of England's important iron and steel industries are located at tidewater, as pointed out by Mr. Tyler. With the Warrior River already developed to practical navigation into the Birmingham district, and the Government's present and future appropriations being applied for still greater development, an outlet to foreign markets has been made available. Thus thousands of tons of Alabama iron and steel products per

	Eastern Fdy.	B'ham. Fdy.	Great Britain	Lorraine	Belgium
Ore	\$9.50	\$6.25	\$9.70	\$2.25	\$4.25
Coke	10.50	5.75	6.80	8.75	10.00
Stone	1.25	0.35	0.70	0.00	0.00
Labor	1.75	1.75	1.75	1.50	1.00
Other	2.00	2.25	1.75	0.80	1.00
	\$25.00	\$16.35	\$20.70	\$13.30	\$16.25

annum are now moving to Latin America, as well as to eastern and far western points of the United States, and to Europe and Asia. In the past 20 years the production of steel in the South has increased more than 650 per cent, and the cast iron pipe and fittings industry, now supplying upward of 1,000,000 tons per annum for domestic and foreign consumption, has been developed wholly within that period. The Birmingham district alone now manufactures 35 per cent of the cast iron pipe and fittings produced in the United States.

Therefore, at the very seaport gateway to the foreign markets of the world are located a potential ore supply of between 1,750,000,000 and 2,000,000,000 tons of high-grade self-fluxing phosphoric iron ores of sedimentary origin and 7 ft. average thickness, 3,500,000,000 to 4,000,000,000 tons of cheaply mined high-grade coking coals 4 ft. to 6 ft. average thickness, and billions of tons of limestone and dolomite within a 25 mile radius of the blast furnaces—all available at minimum freight assembling charges. There is not an industrial center in the entire world today which enjoys a juxtaposition of raw materials comparable with the Birmingham, Ala., district. Its coordinated factors produce the "keystone," as phrased by Mr. Tyler, of the arch on which rests the economic structure of the future iron and steel industry as related to successful competition in world markets.

While these natural resources of the Birmingham district are now being utilized on a substantial scale, it is quite within bounds to say that they are capable of development to the extent of supplying the entire iron and steel making requirements of the United States, on the present scale, for 28 to 30 years, without having to resort to the enormous supply of low-grade ores or low-yield coking coals available within a 30-mile to 40-mile radius of Birmingham.

*Consulting Metallurgist, Birmingham, Ala.

Cutting Metals with the Electric Arc

Hourly Rate and Cost of Cutting—Use of Methods for Scrapping Wrecked or Discarded Steel Freight Cars—Non-Ferrous Uses

BY A. M. CANDY*

ARC cutting is purely a melting process, the heat energy of the arc terminal being directed along the line of the cut. Graphite or carbon electrodes are usually employed for this work, although



Fig. 1—Gray Iron Casting Riser Cut Through Neck, 3 x 9 In., in 5 Min.; Through Main Portion, 8 x 8 In., in 17 Min.

bare metallic electrodes have been used by operating them at current values in excess of those used for welding. As this latter scheme is not economical, it will not be discussed. In special cases metallic electrodes heavily wrapped with asbestos yarn, using current values higher than normal, have been used for cutting, the electrodes being first dipped in water, which forms steam and blows the molten metal away. This method, however, is also very expensive and has been used only to a limited extent by the British Admiralty for cutting deep, small diameter holes in armor plate.

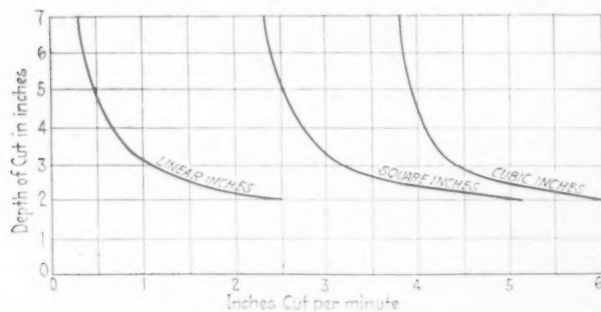


Fig. 2—Speed of Cutting With Various Depths and Forms of Section

For general cutting work graphite or carbon electrodes are used with current values of 300 to 1000 amperes, depending upon the nature of the work and the cutting speed desired.

Foundries make use of arc welding equipment for repairing defective castings and use the same apparatus for cutting off risers and burs from their castings. Fig. 1 shows a riser from a large gray iron casting which was cut through the 3 x 9 in. neck in 5 min., using 800 amperes. Just as a demonstration, the riser was then cut through the main portion, 8 x 8 in., in 17 min., using 800 amperes. With labor at 60c. per hr.

*General engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

and electric power at 2c. per kw. hr. for the motor-generator, we have a cost of 15c. for cutting neck and 52c. for cutting body of the riser. This works out at about 56c. per 100 sq. in. for the neck and 81c. for the body.

The speed of cutting castings of several forms is shown by Figs. 2 and 3. Fig. 4 shows two sample cuts made at 400 amperes. The cast iron at left, 1½ in. thick, was cut at a rate of 16½ ft. per hr. and the steel at right, 1 in. thick, at rate of 21½ ft. per hr. These represent respectively 24% and 21½ ft. per hr. for each inch in thickness.

Where it is desirable to cut the material to accurate dimensions, it is necessary to lay out a guide line with white lumber crayon which the operator can follow

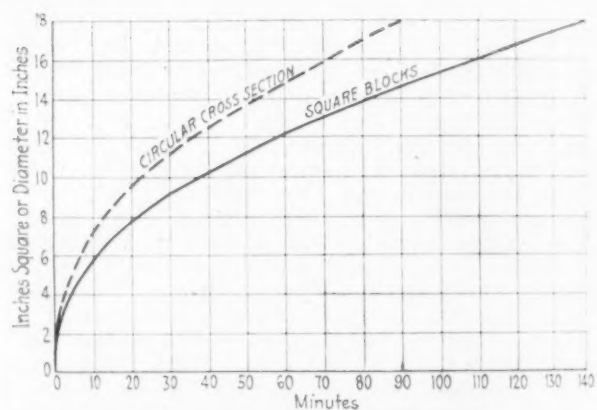


Fig. 3—Time Required for Cutting Round and Square Sections of Cast Iron

with his arc. It is then possible to make a neat cut in ¼, ⅜ or ½ in. thick plate steel as illustrated by Fig. 5. This shows a piece of ¼ in. plate steel cut at rate of

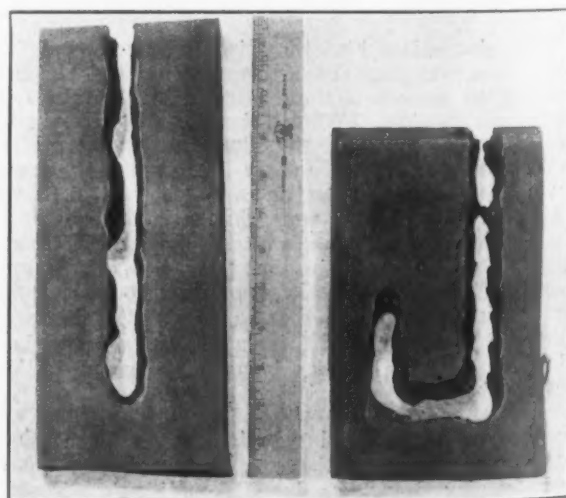


Fig. 4—Sample Cuts in (Left) Cast Iron 1½ In. Thick at 16½ Ft. per Hr. and (Right) Steel 1 In. Thick at 21½ Ft. per Hr.

75 ft. per hr., using 450 amperes (18½ ft. per hr. per in. of thickness.)

Fig. 6 shows some rivets cut off with the arc. Companies scrapping and rebuilding steel freight cars will find the arc process the cheapest method for cutting rivets and for cutting up steel plate material into pieces sufficiently small to be charged directly into the

originally 6½ ft. wide and 7 ft. long along the central cut. The metal was approximately 1½ in. thick through the sections where the side cuts were made, which was at rate of 3½ ft. per hr. The thickness of the metal through the central cut varied from about 1½ in. at the edge to 7 in. at the center, the average being about 4¼ in. This cut was completed in 5 hr.

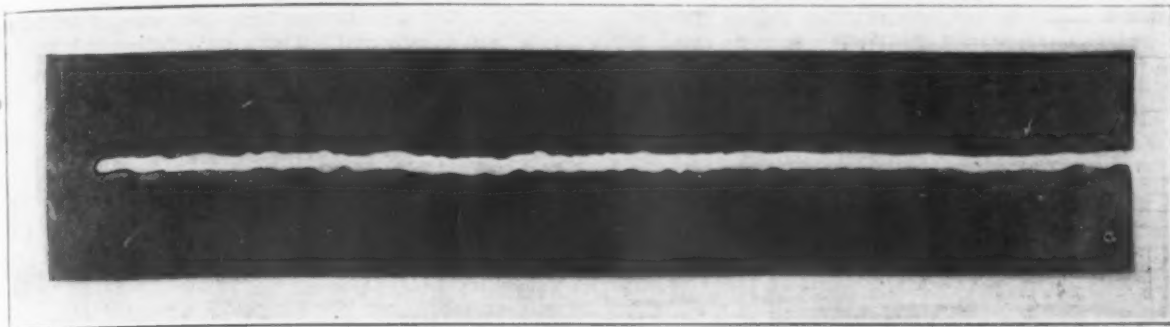


Fig. 5—Cut Made in ¼-In. Steel Plate, by Following a Cray on Line, at Rate of 75 Ft. per Hr.

cupola, or for recutting in a shear. As the plates in these cases are generally heavily covered with paint or rust, current values of 400 to 600 or even 800 amperes are used. With 800 amperes, cars have been cut up at an average rate of 75 ft. per hr., an entire coal car being cut up in 4 hr. into pieces sufficiently small to be handled by four men who were shearing the material into charging size. The cost of the arc cutting, including labor and power for the motor-generator, was \$6.80.

For cutting rivets, currents of 400 or 600 amperes are usually used. With 400 amperes, average opera-



Fig. 6—Rivets Cut Off by the Arc. Illustrating Method of Cutting Up Steel Cars, Tanks, etc.



Fig. 7—(Lower Right) Copper Billets, 4 x 5 in., Cut in Two in 6½ to 7 Min.

Fig. 8—(Above) Copper Slag Cut Through with Arc. Cut is 7 ft. long and has a maximum of 7 in. thickness



tors will cut from 1800 to 2000 ½-in. rivets per 10-hr. day, and some operators will run as high as 2600 to 3100 such rivets when the work is on a piece rate basis.

Cutting with the arc is not limited to iron and steel, but can be applied equally well to non-ferrous metals such as brass, bronze and copper. Because of the high thermal capacity and high heat conductivity of copper, it is necessary to concentrate the applied heat at a sufficiently high rate to melt the copper before the heat is dissipated in it. To do this cutting effectively it has been found most satisfactory to use a current of 800 to 1000 amperes. The two copper billets, 4 x 5 in., in Fig. 7, were cut in two in 6½ and 7 min., respectively, using 950 amperes.

Fig. 8 shows a large piece of copper slag which was

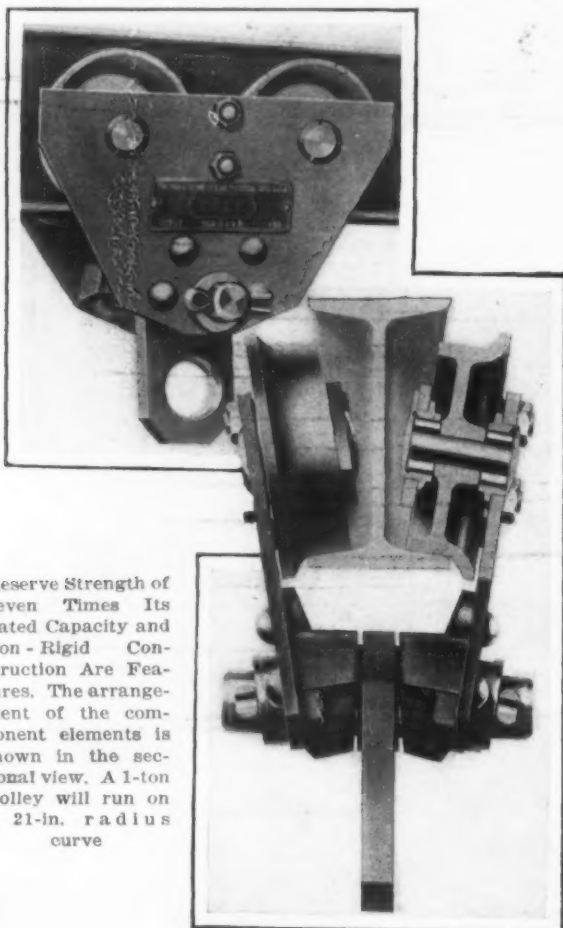
A current of 1000 amperes was used. The cost of doing the work, on the basis of labor at 60c. per hr. and electric power for the motor-generator at 3c. per kwhr., was \$16.78.

The management and workers of the Fore River Works, Bethlehem Shipbuilding Corporation, Ltd., have adopted a representation plan similar to that in effect in other subsidiary plants of the Bethlehem Steel Corporation. Committees of employees and committees appointed by the management will cooperate in all questions of industrial relations, including matters dealing with wages, bonuses, safety methods, tonnage schedule, working conditions, living conditions, education, recreation, conditions of employment, etc.

Steel-Plate Roller-Bearing Trolley

A steel-plate roller-bearing trolley, known as the Yale, for which exceptional strength and flexibility are claimed, has been placed on the market by the Yale & Towne Mfg. Co., Stamford, Conn. A reserve strength of seven times its rated capacity is claimed, and under test a 2-ton trolley is said to have withstood a load of 28,000 lb., which broke the I-beam. A 1-ton trolley will run easily on a minimum 21-in. radius curve.

The construction of the trolley may be noted from the illustration. The wheels are mounted on roller bearings and attached to the side plates, which in turn are connected together by the single equalizing pin which supports the shackle plate. The roller bearings



Reserve Strength of Seven Times Its Rated Capacity and Non-Rigid Construction Are Features. The arrangement of the component elements is shown in the sectional view. A 1-ton trolley will run on a 21-in. radius curve

assure easy lateral motion and are provided with a grease chamber designed to prevent dust from reaching the bearings. The spreader castings are riveted to each plate as shown. These are intended to give large bearing surface for the equalizing pin and are shaped to protect the trolley and act as a bumper which engages the track stop on the lower flange at the end of the I-beam track.

The axles, which are said to be subjected to practically no bending strain, are set parallel to the I-beam flange pressed into wheel-hubs and supported by the inner bearing plate.

The wheels have chilled iron treads. The equalizing pin is of cold-rolled steel and supports either the shackle, eye or clevis. Where head room is needed the chain block can be hooked directly over the equalizing pin.

Robert Bracken, auditor and custodian of lands, State of Indiana, has advertised for sale on May 4 a tract of 319 acres of State-owned land near Hammond. The land is in several parcels, each of which has been appraised, making a total of \$111,780. The land is that wanted by the East Chicago Company for the Jones & Laughlin Steel Corp. mill project in Hammond. It is to be sold under a law enacted in 1922 to cover the situation which grew out of a controversy concerning the value of the land.

Desulphurization of Coke by Steam

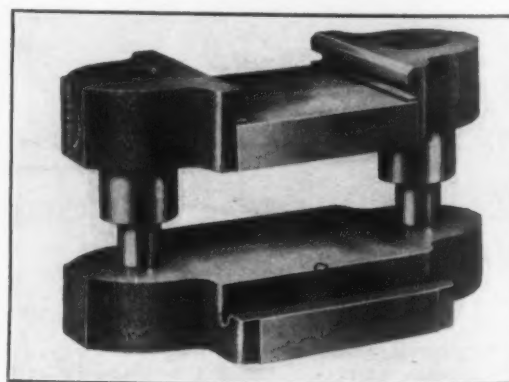
In the course of laboratory experiments in the desulphurization of coke by steam, being conducted by the Department of the Interior, at the Pittsburgh experiment station of the Bureau of Mines, steam tests at atmospheric pressure for the removal of sulphur from chunk size coke have been finished. Combined sulphur as FeS, FeSO₄, and free sulphur (not including solid solution sulphur) in Ohio coke was reduced from 1.38 to 0.72 per cent. The solid solution sulphur was not affected, but it has been shown that this has very little effect in contaminating sponge iron in the blast furnace. In Illinois coke 0.62 per cent sulphur corresponding was reduced to 0.48. Clairton coke low in sulphur was reduced from 0.29 to 0.17 per cent. Sulphur in a sample of gas-house coke from Philadelphia was reduced from 0.81 per cent to 0.60. These results were obtained without application of vacuum, which may reduce still further the amount of sulphur. Very little steam is required.

Die Set for Accurate Stampings

A die set designated as type Z and intended for use in making stampings for adding machines, typewriters and similar machines requiring parts of close accuracy has been added to the line of standard die sets of the Danly Machine Specialties, Inc., 4911 Lincoln Avenue, Chicago.

The tool is shown in the accompanying illustration. The "floating" punch shank incorporated is intended to relieve strain due to play in the ram of the press. The punch is guided into the die by extra long, hardened, ground and lapped bushings which do not leave the leader pins. The adapters which take the place of the punch shank are available with either solid swivel, spring knockout or for positive knockout. Another feature of the adapters is that they need not be removed from the ram when changing dies, it being only necessary to remove the clamps from the shoe and slide the die set from the adapters. This is intended as an advantage for quick set up.

The sets are of semi-steel and are accurately ma-



Die Set Having Accuracy and Quick Set Up Features

chined and parallel. Punch holders are interchangeable. The range of sizes carried in stock will accommodate dies 4 x 4 in. to 10% x 10% in.

Coke Rates Not Justified

WASHINGTON, April 17.—In a decision announced last Thursday the Interstate Commerce Commission condemned as having not been justified increased rates on coke from Chicago, Peoria and St. Louis, to destinations in Southern Missouri and Eastern Kansas. The higher rates had been published to become effective Dec. 15, 1922, but were suspended on the protest of the United Iron Works, Inc., of Kansas City, and the St. Louis Coke & Chemical Co. of St. Louis. The tariffs proposed increases of 84c from Chicago and from 48c to 85c from Peoria and St. Louis.

Lining Acid Electric Furnaces

Various Materials Which Can Be Used and How to Handle Them—The Best Lining Described

BY J. M. QUINN*

CAREFUL selection of materials for lining the acid electric furnace is essential. It should be kept in mind that the materials containing the least amount of impurities have the highest melting point and therefore are more refractory than those containing elements which dilute the purity.

Ganister rock crushed, to pass through a $\frac{1}{2}$ -in. mesh screen, 50 per cent of which is $\frac{3}{8}$ -in. mesh down to fine grains, is used extensively for electric furnace linings. Ganister, analyzing as follows, has given excellent service in arc electric furnaces producing steel for small steel casting where high temperatures were essential:

Silica, SiO ₂	Iron Oxide, Fe ₂ O ₃	Alumina, Al ₂ O ₃	Calcium Oxide, CaO	Magnesium Oxide, MgO
98.43	0.57	0.60	0.10	Trace

Ground ganister is about $\frac{1}{4}$ in. mesh with a large proportion of fine material and has been used for electric furnace linings where ordinary steel pouring temperatures are required, such as large castings and ingots. Ground ganister is approximately half as costly as crushed ganister rock and has a lower silica and higher alumina content, as shown below; consequently its melting point is lower than ganister rock:

Silica, SiO ₂	Iron Oxide, Fe ₂ O ₃	Alumina, Al ₂ O ₃	Calcium Oxide, CaO	Magnesium Oxide, MgO
95.00	Trace	2.50	Trace	Trace

Glutrin, molasses and silicate of soda (water glass) diluted with various amounts of water, usually one to three parts water or according to the moisture contained in the ganister, are used as binders for this refractory.

In addition to ganister, silica sand, called furnace bottom sand, is used for making bottom and patching the furnace between heats. The grade used by acid open-hearth steel furnaces is nearly always suitable for this purpose. One well known brand analyzed:

Silica, SiO ₂	Iron Oxide, Fe ₂ O ₃	Alumina, Al ₂ O ₃	Calcium Oxide, CaO	Magnesium Oxide, MgO	Loss
94.41	1.30	3.15	0.04	0.13	1.10

In many foundries where the purchasing of car-load lots of furnace bottom sand is not advisable, it is more economical to use new silica molding sand mixed with a small amount of fire clay. The proportions of this mixture depend on the grades of these commodities available and is easily determined by using experimental batches to find the one most suitable.

Brick Used for Linings and Roofs

Silica brick made by the large refractory manufactures is a satisfactory product for linings and furnace roofs. A first quality clay brick is used in roofs on some electric furnaces, especially where the operation is intermittent. Carborundum and bricks of high alumina content are seldom used in acid furnace linings because their cost is many times that of silica and clay brick. It is not generally believed that the longer furnace life obtained by the use of these brick warrants the additional expense. Brick analyses are not specified here as the structure and degree of burning are also important items in the life of brick.

Some electric furnace manufactures recommend

$\frac{1}{4}$ in. to $2\frac{1}{2}$ in. of a poor heat conductor such as asbestos, "Sil-O-Cel" brick, etc., next to the inside furnace shell. The thickness of the insulation they specify is in most cases theoretically correct to obtain minimum heat losses with maximum refractory life. The writer has operated furnaces lined as recommended and, because of the short refractory life, has rebuilt furnaces without heat insulation, resulting in better operating conditions, lower refractory cost and, if there was more power used because of the increased heat radiation, it was not apparent from the kilowatt-hours used per ton of steel produced.

The question of retaining insulation in electric furnaces is a problem for each insulation. Should the furnace bottom become soft or "mushy" during the refining period or the side walls give short service, the removal of any insulation certainly would prolong the life of the refractories. Many electric arc furnace operators have said that better operating conditions were secured when insulating material was not used. This opinion is especially expressed when the furnace is lined acid, as refractories of this type are poor heat conductors.

Best Method of Lining

The best method for lining an electric furnace is to use high grade silica brick for the bottom and side walls up to the roof. The brick should be laid dry, although a watery grout of silica clay is sometimes used to obtain tight joints. On heating to high temperatures, silica brick expand $\frac{1}{4}$ in. per ft.; leaving small spaces between some of the brick is recommended. After the brick are laid according to blue print and specifications, care should be taken to dry the new brick thoroughly. As the bricks warm up the heating may be increased gradually until the furnace is fairly hot, usually in 24 to 48 hr., depending on the size furnace and thickness of the lining. Power can now be put on at low amperage and the heating-up continued by the electric arc until the brick are glistening or just melting.

Building up and setting the furnace bottom is of prime importance to the life of the furnace and also to the speed in melting down the charge and bringing it up to pouring temperature.¹ To insure a hard lasting bottom it should be burned in layer by layer with furnace bottom sand moistened with water, so that the sand is set all the way through and is not merely glazed over the top with a soft spongy interior that will rapidly eat away as soon as the surface is cut into. The bottom should be so built that, when finished, it will be cup shaped rather than saucer shaped. In other words, the bottom should be rather deep with steep sides instead of one gradually sloping up to the side walls of the furnace. In building this bottom up to the side walls care should be taken that no ledge is left at the point where the bottom meets the side walls. There are several advantages in this construction. A bottom of this type permits the charging of a greater tonnage per heat in a furnace of a given area and insures the lodgment of the material charged more directly under the electrodes than in a furnace where the bottom is flatter or saucer shaped.

When the heat is melted down on a bottom of this type there is no unmelted material left hanging to the side walls which must be pulled loose and into the bath in order to be melted. Where the side walls are steep, this material will of its own weight tear loose from

*Superintendent of electric furnaces, United States High-Speed Steel & Tool Corporation, Troy, N. Y.

¹"Heat Modifies Acid Furnace Reaction," *Foundry*, Jan. 15, 1921.

the sides and slide into the bath. The precaution in not leaving any ledge at the junction of the bottom and side walls is to eliminate any chance of some of the material charged to lodge there and fail to slide into the bath and so delay the furnace while the operators reach in with a bar or hook and drag it into the bath.

One of the Cheaper Linings

A cheaper method for lining the furnace and nearly as satisfactory from an operating standpoint is to use rammed-in crushed ganister rock instead of silica brick. Substantial wood forms are made in one to two foot sections, the outside dimensions of which correspond to the desired inside dimensions of the furnace. Approximately one inch to the foot taper is sufficient allowance for the drawing of the wood forms where nearly perpendicular walls are specified for the furnace. The mixing of crushed ganister rock with diluted glutrin or water glass (the latter is preferred) to the consistency of molding sand is most satisfactorily done in a sand mixer usually found in steel foundries. Sufficient time should be taken so that a uniform product is secured. Fire clay or other materials as additional binders which will lower the melting point of the ganister should not be used, even though the ganister apparently has no "body" or will not hold together like molding sand. The ganister should not be too wet as it will not ram hard enough and become mushy.

The moist ganister is shoveled into the furnace so that when spread out there is not more than 3 in. of loose ganister at any point. This batch is then rammed in, preferably with pneumatic rammers, although hand rammers can be used, but they do not usually prove satisfactory as the men cannot ram hard continuously for hours. Each batch of ganister should be rammed as hard as possible, for the harder it is the longer the furnace life. When enough ganister has been rammed into the desired height of the furnace bottom, the first section of the wood form is placed, then the ramming continued. Ganister door jambs and arches will not give as good service as silica or clay brick, especially where scrap is charged through the doors. Therefore silica or clay bricks are recommended, one course for door jambs and one or two courses for door arches. The brick may be laid dry, a strong collapsible form being provided for each opening so that the ganister can be rammed without disarranging the brick.

After the furnace side walls have been built up to the roof ring level all wood forms are removed, the bottom shaped up with rammed-in ganister and the sharp corners rounded off around the door openings. When the roof is placed, the furnace is dried and warmed up similar to the method described for a silica brick lining. The heating of the ganister lining must be continued until the walls are well glazed, otherwise the ganister will peel off in large pieces.

It is good practice to continue the glazing or burning in of the ganister with the electric arc for a few hours so that the ganister will be fused at least to a depth of 2 in., which takes 4 to 6 hr. After this period of high temperatures considerable moisture will still be retained in the furnace lining. It is not unusual to see steam coming from the vent holes in the furnace shell for more than a week after the power is first put on.

Even though the lining is not entirely dry after the glazing period, scrap can be charged into the furnace and the first heat started. As some of the steam formed in the lining is absorbed by the molten metal the first few heats of steel made are invariably "wild" and excess deoxidizers like ferromanganese, ferrosilicon and aluminum can be used to kill the steel, and metal of a usable quality can be made. As the water and gases from the volatile or combustible matter are gradually driven off, each heat will be less oxidized from this source and high quality metal can be made after three or four days' continuous operation.

Ground Ganister for Linings

When ground ganister is the material provided for lining the furnace, this refractory is handled similar to the method described for crushed ganister rock. As the ground ganister contains a large proportion of fine particles, old silica brick, that is, brick bats from a fur-

nace or roof being relined and ordinarily thrown away, are broken up in an alloy crusher or even by hand to about $\frac{3}{4}$ -in. mesh and mixed with the ground ganister. The proportion of broken brick bats necessary depends on the fineness of the ganister used, the object being to secure a material as nearly like crushed ganister as possible. Sometimes old silica brick are not available or are too costly to break up, so a product called silica grits, or even $\frac{3}{4}$ -in. mesh crushed ganister rock free from fines, is used to secure the concrete-like texture in the lining. The building of many furnaces has proved that for all rammed-in linings a mixture of large, medium and fine material gives the longest furnace life.

Nearly all the electric furnace manufacturers specify silica brick for their furnace roofs. Or when fire clay brick do not give satisfactory service in roofs, silica brick are usually installed. They have fusion points² which are practically the same as those of the more refractory fire clay brick (1700 deg. C. or 3100 deg. Fahr.). These silica brick, however, must be heated very slowly, especially at the lower temperatures, because of this tendency to spall. When this precaution is taken and a temperature of over 1000 deg. C. is maintained, a silica brick roof should give extended service. It has been the writer's experience that well designed cubical blocks spall less readily than the standard silica brick shapes, as the latter are often warped in the manufacturers' kilns.

Insulation of any kind should be carefully avoided when refractories are used at their limiting temperatures, for when the heat which is naturally carried away accumulates on the inner hotter surface, failure invariably results. Care must be exercised in preventing the accumulation of plant dust on the furnace roof, for it acts as an insulator of the refractories.

For patching the furnace bottom and slag line between heats, furnace bottom sand, ganister and ground silica brick are used, depending on which material is available and cheapest. One serves the purpose just as well as the other when properly prepared and placed in the furnace in a similar manner. To aid these refractories to stick where placed in a furnace, they should be moistened slightly and can be mixed by hand. Water is most generally used, but when the refractory will not stay where desired, diluted water glass or glutrin is mixed with the patching material to secure this sticking quality. Diluted water glass gives better results than glutrin, for it has both binding qualities and is itself highly refractory.

After a heat has been poured from the furnace, the men should start patching as soon as possible to utilize the high furnace temperature and aid the patching material to stick and partially burn in. Where the refractory is shoveled into the furnace it should be dry enough to leave the shovel easily and in a compact mass for the force behind each "shot" aids the material to stick. When a bottom spoon is used the mixture can be in the form of a heavy mud, as there is little or no force of impact when placed in the furnace and more moisture is needed to hold the patching material in place while being set by the high heat.

[This article will be followed by one discussing acid practice in electric furnaces.—EDITOR.]

The annual meeting of the members of the American Iron and Steel Institute will be held on Monday, May 7, at noon at the office of the Institute, 40 Rector Street, New York, to elect directors and to determine whether to change the number of directors from 21 to 24. The general meeting for the reading of papers will be held on the fourth Friday in May.

In experiments on the low-temperature carbonization of coal from the Pittsburgh seam, being conducted by the Department of the Interior at the Pittsburgh experiment station of the Bureau of Mines, the yields of tar for different seams was 22.3 to 35 gal. per ton of coal, and of gas, 2150 to 3300 cu. ft. per ton.

²Refractories for Electric Furnaces, R. M. Howe, *The Foundry*, Nov. 15, 1920.

Performance of High-Speed Cutting Tools*

Milling Cutters of Forged and Cast High-Speed Steel and Special Composition Compared—Method of Determining Relative Merit Value

BY JEROME STRAUSS**

IN a recent paper¹ several groups of tests of high-speed steel lathe tools were described and from careful consideration of these data a number of interesting conclusions were drawn, among these being the following:

The chemical composition of high-speed tool steel is recognized, but seldom emphasized; nevertheless it is important and when purchasing, should be considered along with those factors which go to make up "quality."

The application of breakdown tests to the purchase of high-speed steel is unsatisfactory, owing to inability to classify these steels on the basis of small differences in performance; further it appears that small changes in cutting conditions even when performing the same class of duty may alter the relative superiority of brands or composition types.

Metallurgical laboratory investigations indicate that differences in behavior of various compositions when subjected to heat treatment may be so great as to offset small performance differences. Also fracture is not necessarily an index of cutting ability.

Studies of milling cutters also have been made over a period of several years for the purpose of comparing with high-speed steel forged blanks or bar stock, cast high-speed steel tools and forged or cast alloys con-

taining little or no tungsten. These tests were made, as in the case of the lathe tools, on heat-treated 3.50 per cent nickel steel forgings of approximately 100,000 lb. per sq. in. tensile strength, this being a material widely used for gun forgings as well as numerous heavy forgings for commercial service. Unlike the lathe tests just referred to, all tests of milling cutters were made with a lubricant and coolant, each cutter being run throughout its life under a heavy stream of paraffin oil (sp. gr. about 0.89).

The first of these tests involved a comparison with forged tungsten steel blanks (C., 0.71; Si., 0.23; S., 0.17; P., 0.012; Mn., 0.38; W., 17.24; Cr., 4.23; V., none) of two cast cutters obtained abroad containing approximately C., 1.50; Si., 0.75; Mn., 0.20; Cr., 13.50; Co., 3.50; Mo., 0.75 per cent. The performance of these tools has been recorded elsewhere.³ Suffice it to say that operating these $\frac{1}{4}$ -in. by 4-in. cutters at speeds increasing from 114 to 330 ft. per min. and feeds from 8 to 21 in. per min., with a 0.10 in. depth of cut and, using as a basis for relative performance computation, a merit value obtained as the product of the weight of metal removed by its rate of removal, the cast cutters averaged 67 per cent and the forged high-speed steel 99 per cent.

The second group of tests involved $\frac{1}{4}$ -in. by 4-in. cutters of rolled tungsten high-speed steel, a forged cobalt-chromium-molybdenum alloy, a cast chromium-

*Based on a paper presented before the March meeting of the Washington Chapter of the American Society for Steel Treating.

**Chief chemist, U. S. Naval Gun Factory, Washington, D. C.

¹H. J. French and Jerome Strauss—"Lathe Breakdown Tests of Some Modern High-Speed Tool Steels"—*Trans. A. S. S. T. E.*, 11, page 1125.

³*Proc. A. S. T. M.* XIX, page 173.

(Continued on page 1150)

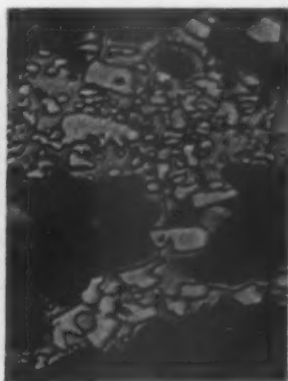


Fig. 1—Cutter D-1 As Used, Magnification 500 dia. Fig. 2—Same cutter, annealed, magnification 500 dia. Fig. 3—Milling cutter, broken in use, magnification 500 dia. Fig. 4—Lathe tool, overheated in heating for hardening, magnification, 500 dia.

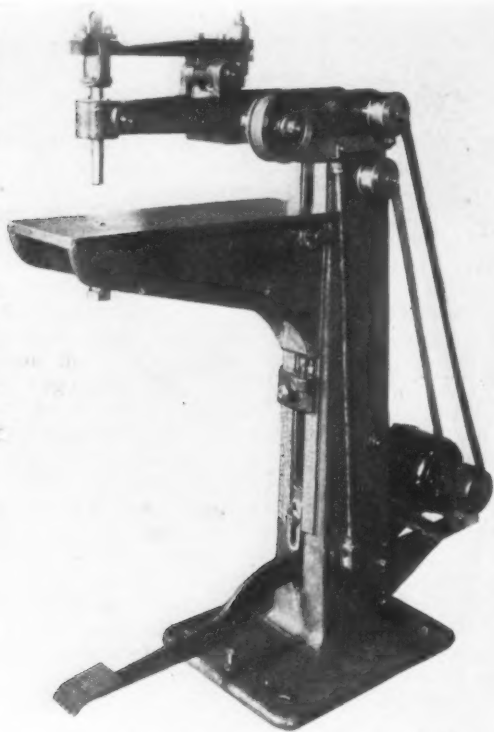


Fig. 5—Lathe Tool, Heated too Low for Hardening, magnification 500 dia. Fig. 6—Lathe tool, satisfactory structure, worked too cold and not annealed, magnification 500 dia. Fig. 7—Slag in string of carbides in lathe tool, magnification 250 dia. Fig. 8—Structure of hardened cast, Co-Cr cutter, magnification 500 dia.

New Rotary Vibrating Riveter

The Grant Mfg. & Machine Co., Bridgeport, Conn., has placed upon the market a No. 4 rotary vibrating riveter, the general construction of which may be noted from the accompanying illustration.

The machine is designed to head rivets up to and including 5/16 in. in diameter. It has a depth of throat of 18½ in., which will permit of heading rivets



Motor Driven Riveting Machine With Throat to Permit Handling of Variety of Work. The machine may be equipped with horn support and arranged for belt drive

in the center of a 36-in. circle. The illustration is of the motor-driven machine, but a belt-driven unit is available, and also the same machine fitted with a horn support for use in riveting circular drums, such as fire extinguishers, or other articles of cylindrical form.

Heavy Increase in Employment and Wages

WASHINGTON, April 17.—Heavy increases in employment and total wages are reflected in March, 1923, figures of the Bureau of Labor Statistics, Department of Commerce, in iron and steel, car building and repairing, automobiles and in other lines when compared with March, 1922.

A combined total of reports in the 43 industries shows that in March 87 per cent of the establishments reporting were operating on a full-time basis, 12 per cent on a part-time basis, and 1 per cent were not in operation. This is an increase over February of 4 per cent, and an increase over January of 7 per cent in full-time operation.

Twenty-six of the 43 industries were working over 90 per cent of full-time as compared with 22 in February, and 16 in January.

Increases in rates of wages were reported by some 400 establishments in 41 of the 43 industries. The leading industries in this respect were: Foundries and machine shops, sawmills, furniture, iron and steel, and lumber, millwork.

Altogether these reports indicate very substantial gains in employment and earnings in March, 1923, as compared with January and February, 1923, and all the months of 1922. Steel shipbuilding showed an increase of 13.1 per cent in the payroll in March when compared with February.

Identical establishments in February reported 2,092,285 employees and total payrolls of \$51,965,545. Therefore in March, as shown from these unweighted

figures for 43 industries combined, there was an increase over February of 2.1 per cent in the number of employees, an increase of 5 per cent in the total amount paid in wages and an increase of 2.8 per cent in the average weekly earnings.

LeBarre Steel Co. Organized

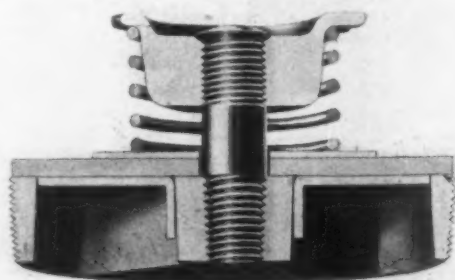
Rowland S. LeBarre has incorporated the LeBarre Steel Co., with headquarters at Cleveland, 504 Union Building, 1836 Euclid Avenue, for the purpose of acting as distributor in Indiana, Michigan, Ohio, Illinois and Wisconsin of the Sizer Steel Corporation's "Elektrik furnace steels" consisting of "Sizer's die blocks," also tungsten bearing, tool, high speed, alloy and carbon bars and billets.

Mr. LeBarre started in the order department of the Illinois Steel Co., Chicago, in the nineties. In 1902 he was sent to New Orleans when a joint office was opened by the Illinois, Carnegie and American Sheet Steel companies. In 1905 he was transferred to the Cleveland office as assistant manager of sales, and he remained there until July, 1919, when he joined the Interstate Iron & Steel Co. at Chicago, in charge of its alloy sales. He remained there until his resignation March 1 to form the new company.

Improves Construction of Pump Valve

Improvements in pump valve construction, intended to increase the efficiency, decrease the cost of pumping and serve to maintain the capacity of the pump at maximum, have been made by the Worthington Pump & Machinery Corporation, 115 Broadway, New York.

The new design, known as the Worthington seal valve, although intended primarily for severe conditions, is available for ordinary pumping also. The rubber used is flexible. One special feature is the so-called bottom plate, which is in effect a middle seat for the rubber valve proper. When the valve is closed, this middle seat carries the entire load and prevents



Pump Valve Designed to Prevent Leakage by Eliminating Wear—on the Rubber. A flexible rubber seal is used and a feature is the so-called "bottom plate"

the rubber seal from cutting on the seats or ribs. The bottom plate moves up and down with the rubber, and so not only acts as a middle seat, but the latter is movable with the rubber and helps to keep the rubber valve in shape even when open. In this way all mechanical functions requiring strength and wear resistance are cared for by metal parts. The flexible rubber acts only as a seal against leakage. The top of the rubber seal is protected by a thin backing-plate intended to keep it flat and prevent wear from contact with the spring.

Employment statistics for March, according to the Department of Labor, show that in 5453 representative establishments in forty-three manufacturing industries, 2,135,564 were employed. Their total earnings for one week amounted to \$54,538,778. There was an increase over February of 2.1 per cent in the number of employees, and an increase of 2.8 per cent in the average weekly earnings.

ALLOY STEELS FOR CEMENT MILLS

Demand for Repair Parts Stimulated by Greater Operation of Plants

BY G. S. EATON

WITH industry in full swing again, steel for new machinery and repair parts is in demand. In such fields as the manufacture of Portland cement, where the repair bill is unusually heavy and production has been at an uncommonly high rate for some time, the requirements amount to a considerable total. Specifications for replacements more and more frequently call for the higher grade, more durable materials, with a marked tendency toward the use of high strength special steels for the many parts subject to shock and vibration.

The chain that links up the various industries of the country sometimes dips down almost out of sight, but still it is there. For example, few would immediately see the connection between an unusually high Portland cement production and a shift in demand by the mills of that industry to the special steels—not of sufficient volume materially to affect the market, of course, yet a noticeable trend.

Demand for cement has always been largely seasonal, and in former years many of the mills shut down entirely during part of the winter for a thorough overhauling. Worn parts were replaced, and new equipment installed. Even at other times except during the summer peak, a short shutdown for repairs was not such a serious matter. But with the increased construction activity of recent months, and the growing practice of continuing building operations throughout the winter, demand has been carried into what was the slack season, and shutdowns at any time become of more consequence. As a result, the cement plants are turning to the more durable although more costly special steels that will last in service probably several times as long as the ordinary grades.

Where Special Steels Have Come In

The flights in screw conveyors are a good illustration of this method of avoiding lost time. Usually the material employed for this purpose is low carbon commercial sheet steel, which is comparatively soft and wears rapidly when handling abrasive material such as cement. Through the use of a steel containing about 0.40 per cent carbon and perhaps 3.5 per cent nickel, hardened by rapid cooling, a much longer life can be secured.

Another instance is found in the case of the swinging hammers in the type of mill sometimes utilized in pulverizing the raw materials and the cement clinker, which is hard enough to scratch glass. Two sets of hammers made from tool steel having a scleroscope hardness ranging irregularly from 40 to 75 lasted for about 10,000 and 12,000 tons of rock each, and then had to be replaced. But when the same grade of tool steel was properly treated, thereby raising its scleroscope hardness to between 80 and 90, the life of the hammers was increased to three times as long as formerly, for these second sets gave outputs of 32,000 and 36,000 tons respectively.

A third example also relates to screw conveyors. Lubrication of the shaft bearings of these conveyors is extremely difficult, and wear is correspondingly rapid. Chilled iron gudgeons were used for a long time with results thought fairly satisfactory. Then an installation of case hardened steel gudgeons was made in direct comparison with the older type, with the result that the steel bearings outwore six sets of those made of chilled iron.

Repairs to cement mill machinery are unusually heavy because of the nature and the number of the crushing and grinding operations to be performed. First, the rock and other raw materials must be reduced to powder, then coal for burning in the rotary kilns must be pulverized, and finally the resulting clinker must be very finely ground to make cement.

With production last year some 14 per cent over

any previous year, and output for the first two months of this year much beyond the rate of 1922, requirements for repair material will continue large. Extra parts for practically every piece of machinery must be kept in stock to avoid long delays in case of breakdown. The country's mills are already equipped to turn out a considerably greater supply of cement than last year's record output, simply by longer periods of capacity production. But equipment replacements and repair parts must be bought in proportion to the scale of operations.

Gases in Monel Metal

The Bureau of Standards has completed determinations of oxygen and hydrogen in samples representing three phases of the deoxidation of monel metal. The samples were all from 50-lb. blocks cast during the progress of a regular heat. These samples represent (1) the metal at the time of tapping the furnace before the addition of any deoxidizers; (2) the above metal after the addition of ferromanganese in the ladle, and (3) the above metal after the further addition of magnesium in the ladle, that is, after all additions have been made. Both oxygen and hydrogen in the metal decreased rapidly with the progress of the deoxidation. The finished metal, as represented by the last sample of this heat and by samples of completely deoxidized metal from two other heats, contains from 0.002 to 0.005 per cent oxygen. All samples appear rather porous under a magnification of 100.

A sample of monel metal prepared as above, except that a portion of the deoxidation was carried out in the furnace rather than entirely in the ladle, showed no porosity, and no oxygen could be detected. A sample of monel metal from a Heroult furnace heat, which had been completely deoxidized in the furnace, likewise was entirely sound and contained no oxygen. Thus of the five samples of finished monel metal examined the three which were deoxidized by addition of ferromanganese and magnesium in the ladle were porous and contained from 0.002 to 0.005 per cent oxygen, while the two which were deoxidized entirely or in part in the furnace were sound and contained no oxygen.

Columbia Steel Corporation Purchases Llewellyn Iron Works

The Columbia Steel Corporation, San Francisco, has purchased the Llewellyn Iron Works, located at Torrance, Cal. In California the corporation operates a rolling mill, open-hearth furnaces and a foundry at Pittsburg, Contra Costa County, and has a foundry also at Portland, Ore. The negotiation will have no effect upon the business of the Llewellyn Iron Works in Los Angeles, which will be conducted independently. Reese Llewellyn and Waller Taylor of the Llewellyn works will become directors of the Columbia Corporation. At Pittsburgh wire and nail mills and facilities to manufacture sheets are also being installed. The properties taken over at Torrance consist of a steel foundry and rolling mill, with both open-hearth and electric furnace equipment. This plant has been operated for more than five years and has an annual capacity of 60,000 tons of finished products.

An apparatus designed for direct plotting of curves in which the time interval required for a definite temperature change and the temperature are the coordinates is described in technological paper No. 230 of the Bureau of Standards, entitled "A Recording Chronograph for the Inverse Rate Method of Thermal Analysis" by H. J. French, physicist. A brief discussion of the advantages obtained by its use is a feature.

On Monday, April 2, the voters of Detroit decided favorably upon the proposal to bond the city for \$5,000,000 for street railroad extensions and for \$12,000,000 for a power and lighting plant.

ASBESTOS-PROTECTED METAL

How This Metal Was Developed Commercially and Some of Its Uses

BY J. H. YOUNG*

STARTING in 1905, at Canton, Mass., with an idea that a steel sheet could be protected from corrosion by dipping it in molten asphalt and then pressing a layer of asbestos felt on each side of the coated steel to protect the asphalt, H. H. Robertson stuck by his idea through thick and thin, and there was considerable thin until the present product was evolved. As may readily be imagined, the original product was a failure, the asbestos felt rapidly washing from the sheet upon exposure and collecting in the roof gutters or on the ground.

To overcome this difficulty, the asbestos felt was saturated with a waterproofing mixture, of which china-wood oil was the principal ingredient. The resultant product was a considerable improvement over the original material and really gave pretty good service. However, as the edges and ends of the steel sheet were unprotected, this resulted in a weakness which was finally overcome by folding the felt over the edges of the steel.

Not until 1909 was commercial success achieved, when the late Dr. E. T. Newsome developed new machinery which made it possible to manufacture a product consisting of a sheet steel core covered with asphalt and wrapped in asbestos felt saturated with a waterproofing agent.

Recognizing that improvements were possible in its product, the manufacturing company adopted the policy, since adhered to, of utilizing a part of its resources each year in development work. As a result of the researches carried out during the period 1909-1916, the present product was worked out and produced in 1916. This product differs from that of 1909 in that asphalt is used to saturate the asbestos felt, and the felt layer itself is protected by a bituminous coating which retards the drying and hardening of the bituminous layers beneath, thus increasing greatly its weather-resisting properties.

In 1911 the company moved from Canton, Mass., to Beaver Falls, Pa., and in 1916 the present factory at Ambridge, Pa., was occupied. Factories in Canada and England were then added.

What Is Required of Roofing and Siding Materials

It is believed that the perfect roofing and siding material, to meet various and complex requirements of roofing service, should have the following characteristics: (1) Strength; (2) Resistance to weathering; (3) Lightness in weight; (4) Adaptability to buildings of standard design; (5) Low fire hazard; (6) Low thermal conductivity; (7) Capability of conforming to any color scheme required, and finally (8) Reasonable first cost and low per-year cost.

Since steel is the basis of asbestos-protected metal, the strength requirement is well taken care of. By choosing steel of the proper gage, it may be made to span successfully any purlin spacing ordinarily used. The weight of asbestos-protected metal is approximately 1.3 times the weight of galvanized iron. Being similar in form, strength and weight to ordinary corrugated steel roofing, it will span with a wide margin of safety all standard purlin spacings, and may be worked into flashings and other standard shapes. It is easily adaptable to the general run of mill buildings without the necessity of designing the buildings to meet limitations of the roofing material.

How It Is Made

The first and most important bituminous coating is applied by pulling the clean steel sheet through a vat of the asphalt maintained at a temperature of 350 deg. Fahr. The viscosity of the asphalt at this temperature is such that a uniform coating weighing about 16 lb. per square (100 sq. ft.) is put on the steel. As the coated steel emerges from this tank, asbestos felt,

previously saturated with asphalt, is pressed onto both sides and folded around the edges of the steel, thus completely sealing it. The next operation consists of running the so-called felted sheets through coating rolls, which operate at a temperature of about 425 deg. Fahr. and apply the top waterproofing coat. The whole process is one in which no solvents are used, the asphalts being applied in a melted condition.

The top or weather-proofing coating is a compounded bitumen, being of the so-called stearin pitch type. It is similar in composition to the best baking japan bases and withstands weathering conditions very well.

It is clear, then, that there are three layers, each of which is of bituminous composition and of substantial thickness. The chemical nature of these compositions is such that they will resist a wide range of chemical conditions. Asphalt will resist the action of a wider range of chemicals than any other commercial adhesive known. A study of the performance of the product under service conditions of all sorts and in all climates shows that it is a relatively durable building material.

Fire Hazard and Corrosion

Since each square of metal has approximately 36 lb. of asphalt on it, and since asphalt is combustible, there is a certain fire hazard involved in the use of the material. Where used on a roof the hazard is of little consequence, because burning embers and the like, falling on such a roof, will not continue to burn; the coating will not spread combustion.

The product has been accepted by insurance companies as equal to steel sheets as a fire risk in factory buildings. This result has been obtained by using asphalt containing hexachlorinated naphthalene as the saturant for the asbestos felt. It is found that, when this procedure has been followed and the sheet is exposed to a fire, the non-combustible vapors of the chlorinated naphthalene dilute the vapors of the asphalt to such an extent that the whole will not support combustion and consequently a fire is localized in so far as the sheets are concerned.

While the fire hazard of a roofing and siding material is an important factor to be considered, it is interesting to note that the loss from so-called slow burning or corrosion is several times as large each year as the loss from fire. One gains much food for thought in looking over the long list of so-called fireproof buildings which have burned each year. Truly the fire hazard is important, but the corrosion hazard is of equal if not greater importance.

Outside of dark colors, such as maroon, dark green and brown, it has been impossible to produce colors satisfactorily, either by painting or by incorporating pigments in its outside coating. White or light-colored drying-oil paints or enamels, when used over bituminous surfaces, become discolored by dissolving the dark bituminous coating. Then, too, the paint films tend to distort the underlying bituminous material, producing an effect commonly termed "alligatoring." If a priming coat of shellac or other similar gum is applied to a bituminous surface, a drying oil paint may then be put on without becoming discolored but, upon exposure, cracking and "alligatoring" take place. For interior finishes a fairly satisfactory result is obtained by the shellac priming-coat method, provided either a cold-water paint or a drying-oil paint is used over the shellac.

Taking up finally the factor of cost, asbestos-protected metal compares favorably in first cost and in per-year costs with other material used for the same purpose. Erected, it costs from one and one-half to two times as much as painted galvanized iron; but on a per-year basis the cost will average very much below that of painted galvanized iron, when its low maintenance cost is considered.

Summary

Summarizing the characteristics of asbestos-protected metal, it may be stated that it is strong, durable, adaptable and light in weight, and has a fairly low thermal conductivity. It has a certain fire hazard, and is not capable of being painted satisfactorily with drying-oil paints. It has a relatively low first cost and a low per-year cost.

*Mellon Institute of Industrial Research, Pittsburgh. Extracts from a paper presented at the Richmond meeting of the American Institute of Chemical Engineers.

Mode of Quoting on Steel Not the Issue

Claims of Parties to the Pittsburgh Base Controversy Reviewed—What Are the Powers of the Trade Commission in Respect to Prices?

BY GILBERT L. LACHER

THE impression is abroad that the United States Steel Corporation has made a formal offer to quote its products on a new basis which would materially affect the disposition of the Pittsburgh basing point case now being heard before the Federal Trade Commission at Chicago. This is a misconstruction of what occurred. In a recent interchange of views at Chicago between the examiner and the attorneys of both sides as to the real issues involved in the case, W. W. Corlett, counsel for the Steel Corporation, merely called attention to a fact long recognized by students of the question, that the mode of quoting steel prices is immaterial to buyers. In other words, it makes no difference to the consumer whether the steel he buys is quoted f.o.b. Pittsburgh, f.o.b. mill, or f.o.b. delivered. What concerns him is not the manner of quoting but what he has to pay for the steel in dollars and cents. Mr. Corlett also pointed out that the Illinois Steel Co. is now selling plates, shapes and bars at prices which, when figured in terms of f.o.b. Chicago, are \$1 per ton higher than the quotations at Pittsburgh of the Carnegie Steel Co. The significance of this comment lies in the fact that although Illinois Steel Co. prices are now generally regarded as being on a Chicago base, the Chicago prices are not identical with the Carnegie Steel Co. quotations at Pittsburgh. The question then arises whether the difference of \$1 per ton lays the corporation open to the charge of discrimination, and if not, how much f.o.b. Chicago prices may exceed Pittsburgh prices before the cry of discriminatory practice will be raised.

The incident was important not because of any new move on the part of the attorneys of either side, but because it focused attention on the issues of the case and started speculation as to the Federal Trade Commission's course of procedure in the event of a decision unfavorable to the respondents.

Why Steel Buyers Complain

Opponents of the so-called "Pittsburgh plus" system have never indicated that their only complaint was against the manner in which steel prices have been quoted. Their charge is that the prices paid by consumers have always been substantially equal to the ruling prices at Pittsburgh plus the freight from that city, regardless of where the steel was rolled. They maintain that prices have been held on an artificial level which penalizes buyers located at points distant from the Pittsburgh district. The answer to these allegations is that Pittsburgh is a center of surplus supply and that through the natural operation of supply and demand, prices of mills in districts of under-production tend to equal the Pittsburgh price plus the freight.

In its defense before the commission the Steel Corporation has employed witnesses and exhibits for the purpose of showing that there was no uniformity in its prices at Chicago such as would indicate an adherence to an artificially supported market level and that Chicago mill production has always been unequal to Western consumption. In other words, it defends the Pittsburgh basing point practice on the ground of supply and demand.

Chicago District Supply and Demand

None of these contentions is admitted by those opposed to Pittsburgh plus. They do not agree that the exhibits of the Steel Corporation disprove sub-

stantial conformity of prices obtained at Chicago when reduced to terms of f. o. b. Pittsburgh, and those obtained elsewhere. Such price variations as they concede are no more numerous, in their opinion, and no greater in dollars and cents than deviations from the ruling market by Eastern mills during the same periods. They deny, furthermore, that Chicago is a center of under-production. Their contention is that if Chicago mills confined their sales to the section of the country described as Chicago territory by the corporation's own witnesses, production would be ample to meet consumption except in periods of abnormal activity when mills throughout the country are equally incapable of supplying the demand.

They assert that the Chicago mills, under the Pittsburgh base plan, always shipped considerable steel to outside territories. It was necessary for these mills to do this, it is contended, because the Pittsburgh district mills have been able, under the Pittsburgh base practice, to invade Chicago territory, and it was possible for them to do so because they had a freight advantage (from Pittsburgh to Chicago) to work against. It is alleged, furthermore, that much steel from outside sources has been shipped into the Pittsburgh metropolitan district, thereby challenging its claim as the center of surplus production.

It is also denied that shipments from Pittsburgh have made up the deficiency in Western supply in times of active demand. Normally, it is contended, the Pittsburgh mills fill up first and are unable to take care of any lack of supply remaining after Chicago mills likewise become fully obligated. While it is conceded that there are small producers in Pittsburgh and adjacent districts who generally contrive to sell small quantities of material at premium prices, this fact does not change the situation in its broad aspects.

Analogy of Southern Pig Iron

Opponents of the Pittsburgh basing point practice also cite the pig iron market as reflecting conditions as they work out under the unrestrained functioning of supply and demand. The Birmingham district, it is pointed out, is a center of surplus production, and considerable Southern iron is consumed in the Chicago district. Yet it is very rare, the argument continues, that the Chicago furnace price is equal to the Birmingham price plus the full freight.

In answer to the last contention it might be said that pig iron prices at Chicago furnaces are never identical with those at Birmingham and, in fact, are generally higher. This again suggests the inquiry whether the present Illinois Steel Co. prices at Chicago on plates, shapes and bars, which are \$1 a ton higher than the Carnegie Steel Co. prices at Pittsburgh, are regarded as discriminatory by opponents of the Pittsburgh basing point plan.

In the pig iron market prices are not the same at all the producing points. In fact, because of variations in market conditions, there are times when furnaces in some centers have been able to invade distant territories. Last year, within the course of a few months, Buffalo iron was shipped by water to Chicago, and, in turn, Duluth iron was shipped by lake and rail to New England. Only recently Valley iron has penetrated far into Indiana and Michigan. Under conditions which are admitted to be controlled entirely by supply and demand, prices in different centers of production are not identical. Is it within the power of the Federal Trade Commission, then, to require the Steel

Corporation to sell at the same prices at Pittsburgh and Chicago? If not, what are its powers?

The Question of "Unfair Competition"

In some quarters it is supposed that the commission's jurisdiction in this controversy is predicated chiefly on the Federal Trade Commission act which prohibits unfair methods of competition. Unfair methods of competition relate to methods used as between competitors, although it is also claimed that the act covers competitive methods which are unfair to the public or to one class of consumers as against another. The act also bears on the competition between the American Bridge Co., a corporation subsidiary, and independent fabricators.

The complaint issued by the commission against the corporation, however, is based largely on section 2 of the Clayton act, which declares it to be unlawful to discriminate directly or indirectly between customers where the effect of such discrimination may be to substantially lessen competition or tend to create a monopoly. It makes a specific exception, however, of discrimination which is made in good faith to meet competition.

There are those who contend that the Clayton act does not apply where the lessening of competition is proved solely in the case of customers, and that the act has reference only to the lessening of competition among those against whom the charge is lodged. There are conflicting decisions in the lower courts on this point, and the Supreme Court of the United States will have to pass upon it finally. The commission's charge, however, is that the Pittsburgh basing practice lessens competition among the steel producers. If this be proved, it will be immaterial what action the court takes as to whether the lessening of competition among consumers comes within the purview of the act.

What, then, can the Federal Trade Commission do in the event that it decides that the Clayton act has been violated? It has no authority to fix prices. Yet

those who are pressing the charges in the pending case maintain that it is by no means powerless to provide an adequate remedy. They assert that if discrimination were prohibited by commission order, chaos would not ensue, as intimated in some quarters, but that prices would seek natural basing points in the various centers of production, just as is now the case with pig iron. Probably three separate bases would develop, namely Chicago, Birmingham and Pittsburgh. They concede that prices would not necessarily be identical at these centers. No interference would come from the commission, they say, unless conditions indicating the maintenance of artificial price levels should again lessen competition among producers and consumers.

In such a case, another complaint might be issued and new charges of unlawful discrimination would be weighed and passed upon. There is little fear in their minds that such action would prove necessary, if for no other reason than that steadily increasing capacity outside of the Pittsburgh district will make it expedient for the mills to create independent price basing points. Industrial development is particularly rapid in the Mississippi Valley and the Great Lakes region and with the Middle West becoming more and more insistent in its demand for steel as cheap as low production costs will permit, they argue that the steel industry will rise to meet the occasion.

Defenders of the Pittsburgh basing practice, on the other hand, characterize these claims as purely speculative and without any foundation in experience. While they concede that a Chicago base may develop naturally through the operation of supply and demand, they assert that it is idle to predict that it will become a fact on all steel products—one year, 10 years or 20 years hence. In their estimation, the commission is wasting much good time and money and they believe that market conditions will be essentially no different in the event of a decision unfavorable to the respondents that they would have been if the case had never been tried.

Examiner's Opinion on Steel Corporation Exhibits

Trade Reports Introduced to Show Normal Steel Requirements of Chicago District

CHICAGO, April 14.—Following the objections which counsel for the Federal Trade Commission raised to the price comparisons offered in evidence by the Steel Corporation in the Pittsburgh base case, Examiner J. W. Bennett took note of the objections and admitted the exhibits, as is his practice in these proceedings, and thereupon developed details of his own opinion as to the application of the documents. He stated that he considered the exhibits competent as showing the fact of variations in Illinois Steel Co. prices from the Pittsburgh market price in some cases, if not in many cases. He considered them not only incompetent, however, but misleading so far as they purport to show the extent of such variations. THE IRON AGE market figures, he pointed out, are historical, not prophetic; that is, they set forth market prices actually made, not those to be made. But all the comparisons in the exhibits were made with previous issues of THE IRON AGE. The fact that the sales price varies from the market price in effect on Wednesday is not satisfactory evidence to prove that it varied with the market price the next Monday. This the examiner regarded as a fatal weakness in the exhibits so far as they purport to show the extent of the variation.

Referring to the special bar, plate and shape mill products which were included in the comparisons, the examiner said that THE IRON AGE quotations were shown by the record to be on bars, shapes and plates, taking base prices only. To compare any other commodity sold by the Illinois Steel Co. with one of these quotations, it must first be reduced to the base which the Illinois Steel Co. charged upon that date for plates,

shapes and bars respectively, depending upon the product intended to be compared. In many instances where such comparisons are attempted in the exhibits, the record shows that there is no exact or fixed relationship between the price of the products sought to be compared and the base price of the company at that time, on plates, shapes or bars, as the case may be. There being no such fixed relationship, the results of such comparisons must be uncertain and misleading. The record shows that prices of articles differing in quality and use from articles on which base prices are quoted by THE IRON AGE are compared with such base prices. Factors of price variation, such as demand, supply, etc., are not constant between the base article and the article compared. There is therefore no proper basis for exact comparison.

The examiner also pointed out that tonnage incapable of being segregated as to items has been treated as a whole, and where one item varied in price, the deviation was indicated for the whole tonnage. In his opinion, where no estimate could be made, the best basis would be the number of variations, or the number of times of agreement or non-agreement. No satisfactory or exact result, he said, has been reached on any quantitative basis.

There is no question, the examiner stated, as to the fact of a number of variations shown in the exhibits. He referred particularly to variations when steel was being sold on a Chicago base, variations where steel was being sold on a Birmingham base, variations because of concessions to classes of industry, and variations to meet local conditions, such as the freight equalization concession to Milwaukee consumers at a

certain time. As to what they may or may not show, that is a different question, he added. Whatever their purpose may be, in his opinion, it would be more clearly set forth if such variations were segregated from the other variations and set forth in separate documents, so that matters of variations which are accepted as proved on both sides may be separated from matters going to show as to whether there were or were not variations of another kind.

In this proceeding the charge of the commission is, he said, that there was price discrimination and that incidental to that price discrimination there was a certain sales method, generally known as Pittsburgh plus, and to the extent that that sales method was in force it brought about certain results, which may be the lessening of competition, or some other thing. It is not helpful to settling the issues of the case, he asserted, to have variations acknowledged by both sides commingled in documents which themselves go to the issues of whether there were or were not variations in other cases.

W. W. Corlett, counsel for the Steel Corporation, reserved the right to offer subsequent exceptions to the opinion, but called the particular attention of the examiner to the fact that there is absolutely no difference in principle between an extra for size and an extra for a special article, rolled on the same mill. Both the extra for size and the extra for a special article are based upon the additional costs required to make that special size or special article as compared

with the cost of rolling a base size article. In the one case, because it is a question of size, there is a published extra. In the other case, because it is a question of a special article, there has been no published extra, but the principle of price is exactly the same in both cases.

To show the consumption of steel in the Chicago district, the Steel Corporation offered in evidence trade reports prepared by salesmen of the Illinois Steel Co. Charles R. Moffatt, in charge of the statistical department of the company, took the stand first and explained what the trade reports were and how they were compiled. The reports comprise information gathered by each salesman as to the normal requirements of each steel consumer in his territory as well as the estimated requirements for the current year. The normal requirements are intended to show average needs over a period of four or five years. Copies of these reports go to the district managers of sales and also to Mr. Moffatt's department. By the latter they are compiled, together with figures showing sales and shipments to each customer. In this manner the sales department is able to ascertain what percentage of the total available business in a given district it is getting.

Following Mr. Moffatt a number of salesmen from different district offices testified as to how they prepared their reports.

Numerous objections to the trade reports were filed by counsel for the commission.

TO HELP RAILROADS

Secretary Hoover Shows How Shippers Can Help Solve Transportation Problems

WASHINGTON, April 17.—Secretary of Commerce Hoover last Saturday made public a letter addressed to National and State trade associations of the country urging them to organize for the purpose of bringing about cooperation through their districts or trades with the railroads so as to develop them to the highest point of efficient use.

The principal directions in which such cooperation can be extended by the trades, Mr. Hoover said, are:

1. The advance storage of their winter coal during the light consuming season—that is, from now until Sept. 1, including the early movement of lake traffic.
2. The loading of all cars to full capacity, their prompt loading and discharge.
3. Reduction of reconsignment shipments and restriction of to-order bills of lading.
4. Demands for no more cars from the railways than can be promptly used.

Mr. Hoover declared that the full and smooth movement of all of the productivity would be the greatest contribution that could be made at the present time in checking inflation or increase in price levels. This statement is accepted as being further evidence of efforts being made by the Administration to prevent the development of an unhealthy boom period that might be expected to result in deflation, heavy liquidation and unemployment, such as developed in the last quarter of 1920 and lasted practically throughout the following year. The program as to transportation fits in with recommendations made up by the Committee on the Business Cycle and other movements that have been taken by the Government to maintain healthy prosperity. The Chamber of Commerce also is engaged in mapping out a transportation policy.

Mr. Hoover pointed out to the trade associations that maximum efficiency in the directions recommended in his communication would mean the addition of more effective commodity movement than would be brought about by the addition of approximately 300,000 cars and 3000 locomotives and the addition of at least 1 per cent to track mileage and terminal facilities.

"The importance of this lies in more than simply the maintenance of continuity of production and full supply of consumption, because any strangulation in movement of commodities through car shortages af-

fects the profits of every individual manufacturer by interruption in his production, and furthermore, such strangulation affects price levels in the most definite fashion," said Mr. Hoover.

In his opening remarks, Secretary Hoover said that the railroad managers under the recent improved conditions are making great efforts in finance and extension of facilities to meet necessities but that full recovery of lost ground must be slow and "if we are to maintain our present rate of productivity and employment it is vital that there be cooperation with the railroad management from both producing and consuming industries to secure the most efficient operation of the railroads." Pointing out that the railroads have asked for this cooperation, Mr. Hoover said that the trades can make a "tremendous contribution to the orderly march of our prosperity if they will undertake it seriously and in an organized fashion."

The Department of Commerce also has begun work providing for a survey with a view to eliminating waste in transportation. A tentative program has been worked out by the Department through various heads of divisions, including the transportation division. It looks to cooperation between industries and the railroads so as to bring about the most efficient form of transportation.

Manufacturers Will Use Moving Pictures for Educational Purposes

William H. Barr, president National Founders' Association, in a letter to members of the association, announces that a foundation is to be organized to cooperate with the Church Motion Picture Corporation, which was organized some time since to utilize the screen for the purpose of moral and religious education. Mr. Barr will be president of the foundation and John E. Edgerton, president National Association of Manufacturers, will be chairman of the board. Mr. Barr states that the organization will reach into every corner of the country and will set up a means of education which will have illimitable benefits for every citizen. He adds: "These things cannot be done without that cooperation which is based on intense interest and intense loyalty to our country without regard to class. But the industrialists of the United States are more gravely concerned with the success of this movement than any other body, and it is to them that this first appeal is issued, and it is from them that great support is expected."

PIG IRON COSTS

Tariff Commission Starts Preliminary Work in Its Investigation

WASHINGTON, April 16.—Preliminary work has been begun by the Iron and Steel Division of the Tariff Commission to obtain costs of production of pig iron. This is being done in accordance with the application granted recently by the commission and made by Eastern merchant blast furnace interests, under the flexible provisions of the Fordney-McCumber act, seeking to increase the import rate on pig iron, which is now 75c. per ton.

The inquiry instituted so far has been confined to the Philadelphia district, where F. Morton Leonard has started a survey by the use of an exhaustive questionnaire, which may be changed from its present form, this depending upon the opinion of pig iron producers as to its adaptability to the cost systems used by the producers. If it should be found that the systems of cost by all the furnace interests are more or less uniform, it is the plan of the Iron and Steel Division to mail out the questionnaires in a standard form, perhaps to follow them, in the principal producing sections, but if there is a wide variance in the system of keeping costs, it is likely that the work will require that it be done by men from the commission in person. It is also intended to use the same questions in making the inquiry of pig iron costs abroad.

The Iron and Steel Division already has decided to extend its inquiry beyond pig iron and to go into costs of steel production. It is not known as yet how far this general inquiry will be extended, but it will be applicable both to the American iron and steel industry and to foreign industries. The actual policy of the commission will be determined at a conference it is to hold at the White House on either Wednesday or Thursday of the present week with President Harding. In any case,

it has been emphasized, where the inquiries are taken up by the commission under its own authority under Section 318, the so-called Frelinghuysen amendment of the tariff act, this does not have any bearing on applications granted under the flexible provisions. Consequently the general inquiries under Section 318 will not call for a recommendation of changes in rates. Changes in rates can be recommended only under the flexible provisions. It is not known when the inquiry abroad will be begun, but it is hoped that when it is taken up it will be possible to get representative figures both as to pig iron and steel costs from representative plants in the various nations which have been previously enumerated in THE IRON AGE.

It is felt that there is no pressing demand to hurry the investigation, particularly in view of the upset conditions of markets in continental Europe as the result of the military occupation of the Ruhr.

The tentative pig iron questionnaire is extremely comprehensive and really looks to the gathering of information in addition to that required under the flexible provisions themselves, but as being necessary to obtain authoritative information as to costs of pig iron for any further purposes that may be required. The information to be gathered will, of course, be confidential in character. The questionnaire deals with the character of ores used, the grade of iron produced, description of the furnaces, how they are charged, the source of raw materials, freight rates, wages paid, and the costs in each instance, including pre-war costs, 1920 peak costs, and recent costs, the latter dealing with the last half of 1922 and the first quarter of 1923. Freight rates on raw materials to the furnaces and those to the markets from the furnaces, also are included in the questionnaire.

The preliminary inquiry in the Philadelphia district, it is understood, will involve probably one-half dozen producers, but it is intended ultimately to obtain figures from all producers, first taking up merchant stacks, but later including steel works blast furnaces.

New Record in Production of By-Product Coke

WASHINGTON, April 17.—Production of by-product coke in March reached the unprecedented total of 3,256,000 net tons, which was 16 per cent greater than the February output, and 5 per cent more than production in January, says the Geological Survey. This total is based on early returns from all but one active plant and includes an estimate for one plant not heard from. The estimated present capacity of by-product ovens is 3,725,000 tons per month of 31 days. Thus the output indicates production at the rate of 87.4 per cent of total capacity and an average of 105,042 tons per day, which is an increase of 4692 tons, or 4.7 per cent over the daily rate of production in February. Of the 71 plants in existence, 64 were active and 7 idle.

Production of beehive coke continued on the increase in March and for the month totaled 2,759,000 net tons, an increase over February of 18 per cent. The March rate of beehive coke production was more than twice the monthly average for 1922, nearly four times the monthly average for 1921, and the same as the monthly average for 1920.

Fifty-one metal working shops in Milwaukee and vicinity showed a total of 19,112 employees in February, as compared with 18,271 in January, a gain of 841. The total number of employees in 36 shops in February, 1923, was 15,199 as compared with 9996 in February, 1922, an increase of 52 per cent. In terms of man hours the 36 shops in February, 1923, were operating at 71½ per cent of their rate during the record month of March, 1920.

A paper on "Separation of Iron and Aluminum from Manganese and Certain Other Elements," by G. E. F. Lundell and H. B. Knowles was published in the *Journal of the American Chemical Society*, Vol. 45, page 676.

Alabama Co. Improvements

BIRMINGHAM, ALA., April 16.—The Alabama Co. is making a number of improvements and extensions. It recently acquired the Etowah mines contiguous to its own properties near Gadsden and is driving openings through its own connections. The work of opening mine No. 2 at Lewisburg near Birmingham, begun in 1920 and interrupted, has been resumed and is being pushed. It is expected to develop 1000 tons by September. The company railroad line connecting Lewisburg mines and coke plants with Birmingham industries and trunk lines is being rebuilt and a new locomotive and 20 new cars have been placed in service. The company is operating pig casting machines at both Gadsden furnaces and found the results thoroughly satisfactory to the foundry trade. The company is booked on iron, coal and coke as far ahead as it cares to go.

Broadcasting of talks on cost accounting from 11 radio stations covering the United States and Canada is announced by J. P. Jordan, president of the National Association of Cost Accountants, 130 West Forty-second Street, New York. There will be a series on what cost accounting means to the consumer, to the worker and to the employer.

Officials of the D. T. & I. railroad have announced that construction of a spur from Flat Rock, Mich., to the River Rouge plant of the Ford company has begun and will be completed in about three months. This means the building of 14 miles of track at an estimated cost of \$90,000 per mile, as the spur will be double-tracked.

Machinists employed by the Judson L. Thomson Mfg. Co., Waltham, Mass., rivets, went on strike last week for an increase of 10 per cent in wages.

STEEL RAIL OUTPUT

Bessemer Almost Negligible as Open Hearth Production Increases

The production of rails in the United States in 1922 was almost the same as in the preceding year, the figures being for 1922 2,171,776 gross tons and 2,178,818 gross tons for 1921. The production of rails weighing 100 lb. or more was larger than ever before, being

Production of Rails by Processes, Gross Tons, 1908-1922

Years	Open-hearth	Bessemer	Rerolled*	Electric Iron	Total
1908	571,791	1,349,153	.....	71	1,921,015
1909	1,256,674	1,767,171	.....	...	3,023,845
1910	1,751,359	1,844,442	.....	...	3,633,031
1911	1,676,923	1,053,420	91,751	462	2,822,790
1912	2,105,144	1,099,926	119,390	3,455	3,327,915
1913	2,527,710	817,591	155,043	2,436	3,502,780
1914	1,525,851	323,897	95,169	178	1,945,095
1915	1,775,168	326,952	102,083	...	2,204,203
1916	2,269,600	440,092	144,826	...	2,854,518
1917	2,292,197	533,325	118,639	...	2,944,161
1918	1,945,443	494,193	101,256	...	2,540,892
1919	1,893,250	214,121	96,422	50	2,203,843
1920	2,334,222	142,899	126,698	297	2,604,116
1921	2,027,215	55,559	96,039	5	2,178,818
1922	2,033,000	22,317	116,459	...	2,171,776

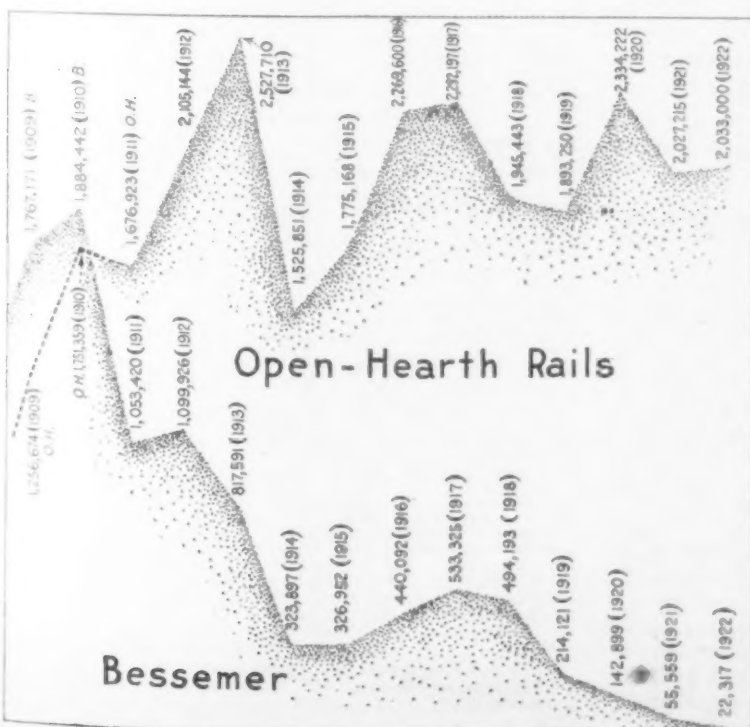
*Rerolled from old steel rails. Included with Bessemer and open-hearth steel rails from 1908 to 1910 inclusive. †Small tonnages rolled in 1909 and 1910, but included with Bessemer and open-hearth rails for these years.

902,900 compared with 849,566 tons in 1921. The production of Bessemer rails has declined almost to the vanishing point, being only 22,317 tons in 1922 com-

Production of Rails by Weight per Yard, 1906-1922

Years	Under 45 pounds	45 and less than 85	85 and less than 100	100 pounds and over	Total Gross tons
1906	284,612	1,749,650	1,943,625	3,977,887	
1907	295,838	1,569,985	1,767,831	3,633,654	
1908	183,869	687,632	1,049,514	1,921,015	
1909	255,726	1,024,856	1,743,263	3,023,845	
1910	260,709	1,275,339	2,099,983	3,636,031	
1911	218,758	1,067,696	1,536,336	2,822,790	
1912	218,672	1,118,592	1,960,651	3,327,915	
1913	270,405	1,967,313	2,265,062	3,502,780	
1914	238,423	1,309,865	868,104	1,945,095	
1915	254,101	1,518,291	742,816	2,204,203	
1916	295,535	1,566,791	1,225,341	2,854,518	
1917	308,258	1,882,673	989,704	2,944,161	
1918	395,124	1,665,165	888,141	2,540,892	
1919	263,803	1,495,577	965,571	2,203,843	
1920	489,043	1,433,333	952,622	2,604,116	
1921	211,568	1,214,936	902,748	2,178,818	
1922	265,541	1,274,731	728,604	902,900	2,171,776

*Includes rails under 50 pounds. †Includes 50 pounds and less than 85 pounds.



pared with 55,559 tons in 1921. The production of alloy-treated steel rails continues to decrease, the tonnage for 1922 being 3163 compared with 6276 in 1921 and 149,267 in 1912.

THE IRON AGE's estimate of the 1922 rail production, given in the issue of Jan. 4, was 8 per cent of a total of 24,600,000 gross tons of rolled material, or

Production of Rails, Showing Increase or Decrease by Processes, Gross Tons, 1921-1922

Kinds	1921	Per cent	1922	Per cent	Increase	Per cent
Open-hearth	2,027,215	93.04	2,033,000	93.61	5,785	.29
Bessemer	55,559	2.55	22,317	1.03	-33,242	-59.83
All other	96,044	4.41	116,459	5.36	20,415	21.26
Total	2,178,818	100.00	2,171,776	100.00	-7,042	-.32

*Decrease.

1,968,000 tons. The institute's total of rails rolled from ingots is 2,055,000, or only 87,000 tons more than this journal's estimate.

Commissioner Sayre Addresses Indianapolis Branch, N. M. T. A.

At the seventeenth annual meeting and dinner of the Indianapolis branch, National Metal Trades Association, held on April 6, the following officers were elected: President, Warren D. Oakes, Oakes Co.; vice-president, George Desautels, Imperial Drop Forge Co.; treasurer, L. M. Wainwright, Diamond Chain & Mfg. Co.; secretary, Andres J. Allen. The members of the executive committee are: W. N. Thompson, Stutz Motor Car Co.; Arthur R. Baxter, Keyless Lock Co.; H. G. Myers, Chandler & Taylor Co.; Alfred Kauffman, Link Belt Co.; W. D. Hamerstadt, Rockwood Mfg. Co., and O. B. Iles, International Machine Tool Co.

At the dinner at the Claypool Hotel, John W. O'Leary, treasurer National Metal Trades Association, acted as toastmaster. Mr. O'Leary urged the importance of training men and upholding the dignity of labor. "I wish," he said, "we could broadcast each day the thought that it is a great deal better to be a good ditch digger than a poor clerk, that it is a great deal better to be a blacksmith and proud of his task than it is to be some clerk in a bank. If we could get that thought across, we wouldn't have so much worry about immigration and the problem as to labor."

Homer D. Sayre, commissioner National Metal Trades Association, delivered the principal address of the evening. He said that the labor scarcity is becoming a real problem. "I believe," he said, "that every man in this room realizes that one can no more overcome any scarcity of labor by stealing another man's employees than he can lift himself by his own bootstraps." He strongly urged that the employer should take every opportunity to teach his employees in a practical way the A B C's of economics, pointing out to them some of the problems of present-day business. He added as a parting thought:

"Explain to them that labor over an average of recent years has had directly 80 per cent of the total proceeds of business, and that the rest of 20 per cent has gone to provide interest on capital, rents and profits, and a great part of this 20 per cent comes back into industry to be distributed.

"You want to get home to them the idea that you cannot predicate wages upon the cost of living, but that they must be based upon production. We followed the former method, as you know, during the war, and with very disastrous results—less production, higher cost of living, and a demand for more wages."

Iron and Steel Exports Recover Slightly

February Movement About Same as a Year Ago and Somewhat Better Than in January—Is Less Than Average of Past 24 Months of Poor Export Business

WASHINGTON, April 17.—Exports of iron and steel products in February totaled 133,902 gross tons, valued at \$14,543,155. This is an increase of 10,712 tons over January, whose corrected total was 123,190 tons, in-

583 tons while they actually amounted to 10,020 tons only.

While exports of iron and steel showed an increase in February, the value of machinery exports declined to \$18,816,063 as compared with \$21,112,412 in January. An increase was made in the number of metal

Exports, January, 1921, to February, 1923, Inclusive

	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
*Average, 1912 to 1914...	2,406,218	221,582	145,720
*Average, 1915 to 1918...	5,295,333	438,462	1,468,026
Calendar year 1919.....	4,239,837	309,682	258,907
Fiscal year 1920.....	4,212,732	248,126	288,766
Calendar year 1920.....	4,961,851	217,958	216,873
January, 1921.....	547,394	3,710	315
February.....	393,323	1,307	92
March.....	230,635	2,320	1,023
April.....	162,592	1,234	678
May.....	142,551	2,541	749
June.....	119,081	1,689	1,106
Fiscal year 1921.....	4,168,619	129,541	82,549
July.....	86,523	2,744	363
August.....	75,827	2,424	2,447
September.....	95,169	3,078	1,318
October.....	106,582	2,830	153
November.....	125,511	1,299	1,869
December.....	134,415	2,550	250
Calendar year 1921.....	2,213,042	28,305	10,363
January, 1922.....	160,920	1,043	4,683
February.....	133,975	1,430	6,627
March.....	208,843	2,724	10,002
April.....	198,830	2,750	9,376
May.....	230,062	3,897	13,091
June.....	212,295	1,996	13,178
Fiscal year 1922.....	1,721,418	28,330	63,127
July.....	157,169	1,943	10,149
August.....	145,640	1,791	9,353
September.....	129,475	5,203	6,810
October.....	132,924	1,553	8,364
November.....	127,782	3,464	7,157
December.....	150,170	3,136	8,449
Calendar year 1922.....	1,986,297	30,922	107,201
January, 1923.....	123,190†	2,482	10,563
February.....	133,902	2,786	7,733
Eight months.....	1,100,365	22,358	68,238

*Calendar years. †Revised.

stead of the previously recorded figure of 129,753 tons. The revision is due to the error of the Government figure, which placed the January steel rail exports at 16-

Exports of Some of the Leading Iron and Steel Products to Principal Countries of Consumption

	Gross Tons	
	February, 1923	Eight Months Ended February, 1923
Plates		
Canada.....	7,517	43,375
Australia.....	...	3,198
Hongkong.....	67	1,644
China.....	18	1,213
South America.....	83	613
Galvanized Sheets		
British India.....	3,235	5,563
Canada.....	1,725	18,486
Cuba.....	997	4,102
Philippine Islands.....	697	8,162
Argentina.....	644	3,466
Mexico.....	449	3,498
Black Steel Sheets		
Canada.....	5,039	33,215
Japan.....	1,049	18,614
Argentina.....	997	2,554
Rails		
Japan.....	10,042	58,779
Canada.....	2,093	11,925
Honduras.....	1,456	5,997
Cuba.....	645	25,665
Barbed Wire		
Brazil.....	939	9,892
Argentina.....	769	7,908
Australia.....	739	6,008
West Indies.....	530	6,120
Canada.....	484	2,595

Metal Working Machinery Exports

	January, 1923		February, 1923	
	No.	Value	No.	Value
Lathes.....	80	\$57,992	50	\$29,041
Boring and drilling machines.....	311	57,922	174	18,409
Planers, shapers and slotters.....	14	15,965	4	6,558
Bending and power presses.....	21	23,205	14	23,705
Gear cutters.....	14	5,550	11	11,276
Milling machines.....	32	65,597	22	28,302
Thread-cutting and screw machines.....	360	28,963	75	36,328
Punching and shearing machines.....	32	34,902	10	7,062
Power hammers.....	35	7,960	8	6,504
Rolling machines.....	..	..	6	3,120
Sharpening and grinding machines.....	1,396	70,233	2,737	70,085
Chucks, centering, lathe, drill and other.....	1,323	19,900	2,191	18,778
Pneumatic portable tools.....	656	26,817	1,763	32,897
Total.....	4,274	\$415,006	7,065	\$292,065

working machines exported in February but their value showed a sharp decrease under the January value, due to a heavy falling off in shipments of the larger type of equipment. The February figures were

Exports of Iron and Steel—Gross Tons

	February		Eight Months Ended February	
	1922	1923	1922	1923
Pig iron.....	1,430	2,786	16,973	22,358
Ferromanganese.....	190	6	603	430
Ferrosilicon.....	45	39	312	512
Scrap.....	2,494	2,647	21,997	23,156
Ingot, blooms, billets, sheet bar, skelp.....	6,627	7,733	17,518	68,238
Iron and steel bars.....	10,187	15,675	17,333	104,065
Alloy steel bars*.....	579	53	1,263	1,896
Wire rods.....	6,008	1,624	62,435	11,453
Plates, iron and steel.....	2,306	10,492	66,151	60,800
Sheets, galvanized.....	9,079	10,379	43,244	63,229
Sheets, black steel.....	18,794	8,368	173,754	60,249
Sheets, black iron.....	1,393	698	3,378	6,754
Hoops, bands, strip steel.....	2,855	3,232	13,467	23,529
Tin plate, terne plate, etc.....	7,304	5,609	42,700	42,721
Structural shapes, plain material.....	3,407	8,652	71,135	65,709
Structural material, fabricated.....	5,640	4,766	11,449	61,116
Steel rails.....	14,093	16,227	128,721	118,853
Rail fastenings, switches, frogs, etc.....	1,425	1,963	6,473	24,420
Boiler tubes, welded pipe and fittings.....	12,527	12,708	93,539	106,267
Cast iron pipe and fittings.....	2,453	2,165	17,032	35,285
Plain wire.....	10,035	5,184	33,780	54,639
Barbed wire and woven wire fencing.....	2,506	5,333	15,767	51,996
Wire cloth and screening*.....	64	112	162	1,183
Wire rope and cable*.....	214	753	254	3,698
Wire nails.....	8,397	2,130	26,780	20,003
All other nails and tacks.....	533	632	3,576	4,855
Horseshoes.....	37	90	361	814
Bolts, nuts, rivets and washers, except track car wheels and axles†.....	1,209	1,123	8,135	12,157
Iron castings†.....	684	1,547	...	10,807
Steel castings†.....	1,121	842	1,570	6,640
Forgings†.....	173	123	...	1,151
Machine screws†.....	153	211	...	1,382
Total.....	133,975	133,902	899,890	1,100,365

*Not reported separately, prior to January, 1922.

†Previous to January, 1922, reported by value only.

‡Revised.

MACHINERY EXPORTS

By Value

	February, 1922	February, 1923	Eight Months February, 1922	February 1923
Locomotives	\$1,269,165	\$127,086	\$16,762,688	\$1,024,253
Other Steam Engines	307,166	126,607	1,258,956	1,442,729
Bolts	23,287	15,449	1,144,129	908,058
Accessories and Parts	159,315	208,996	*373,533	2,268,569
Agricultural Engines	331,479	.....	1,208,548	†1,910,857
Other Internal Combustion En- gines	230,133	98,254	2,025,686	2,598,335
Accessories and Parts for	164,797	223,023	*389,886	1,798,303
Electric Locomotives	36,329	5,570	1,401,950	1,797,134
Other Electric Machinery and Apparatus	715,134	1,217,485	12,089,104	4,337,127
Excavating Machinery	27,291	162,392	*69,845	886,110
Concrete Mixers	26,423	33,953	207,625	365,074
Road Making Machinery	33,244	61,912	*46,460	301,509
Elevators and Elevator Ma- chinery	201,127	226,822	*316,862	1,703,401
Mining and Quarrying Ma- chinery	486,033	611,898	*3,015,650	4,898,437
Oil Well Machinery	174,264	427,458	*403,272	2,954,997
Pumps	333,107	394,588	3,591,743	4,263,457
Lathes	35,247	29,041	742,248	462,106
Boring and Drilling Machines	36,212	18,409	*120,647	347,706
Planers, Shapers and Slotters	12,073	6,558	*32,581	170,542
Bending and Power Presses	103,135	23,705	*177,833	121,149
Gear Cutters	2,503	11,276	*10,607	95,102
Milling Machines	22,761	28,302	*38,360	313,391
Thread Cutting and Screw Ma- chines	7,958	36,328	*19,331	190,868
Punching and Shearing Ma- chines	38,579	7,062	*45,383	91,420
Power Hammers	8,680	6,504	*23,248	89,037
Rolling Machines	189	3,120	*361	159,971
Sharpening and Grinding Ma- chines	65,211	70,085	555,710	581,520
Other Metal Working Machine- ry and Parts of	249,281	418,129	5,034,283	3,979,229
Textile Machinery	1,830,963	992,931	11,752,367	6,541,773
Sewing Machines	321,749	477,429	3,556,215	5,872,705
Shoe Machinery	67,172	85,238	678,875	767,520
Flour-Mill and Gristmill Ma- chinery	87,529	75,569	515,826	755,550
Sugar-Mill Machinery	138,026	191,949	3,497,259	3,057,296
Paper and Pulp Mill Ma- chinery	310,810	153,823	1,935,837	1,102,073
Sawmill Machinery	24,755	60,281	420,928	382,108
Other Woodworking Machinery	115,506	81,719	717,221	1,033,692
Refrigerating and Ice Making Machinery	240,301	266,677	1,209,115	1,294,148
Air Compressors	131,862	171,335	1,186,627	1,530,003
Typewriters	872,412	989,395	6,048,366	7,855,297
Power Laundry Machinery	40,219	64,958	342,729	621,490
Typesetting Machines	266,902	296,370	1,786,181	2,301,159
Printing Presses	433,343	325,805	3,471,185	2,818,613
Agricultural Machinery and Implements	1,107,651	2,788,587	12,061,093	20,819,010
All Other Machinery and Parts	5,979,566	7,193,985	63,649,510	62,469,940
Total	\$17,068,889	\$18,816,063	\$163,965,872	\$161,762,768

July 1 to Dec. 31, 1922.

*Jan. 1 to Feb. 28, only.

7065 machines valued at \$292,065, as compared with 4274 machines valued at \$415,006 exported in January.

Rails constituted the largest item of steel exports in February. Of the total of 16,227 tons, Japan took 10,042 tons and for the eight months ending with February Japan took 58,779 tons out of the total of 148,853 tons for this period. Iron and steel bars rank second in the volume of February exports, totaling 15,675 tons, of which 14,228 tons were steel bars.

An interesting fact revealed by the export figures is that Japan, which up to several months ago was the chief buyer of black steel sheets, and ranked as a close second in January, is now far below the top. Canada was the principal foreign buyer in February, taking 5039 tons out of a total of 8368 tons, while Japan took only 1049 tons.

Something of the measure of the decline in American exports of iron and steel may be obtained from the following table, which shows the average monthly shipments for three pre-war years, four war years and four post-war years. The two years ended Feb. 28, 1923, showed only 72.2 per cent of the monthly tonnage movement of the pre-war years, and the proportion of pig iron and semi-finished material was much less than this.

Average Month	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
Calendar year 1912 to 1914	200,536	18,465	12,143
Calendar year 1915 to 1918	441,278	36,579	122,336
Calendar year 1919	353,329	25,807	21,576
Calendar year 1920	413,488	18,163	18,073
24 Months, March, 1921, to February, 1923	144,860	2,436	5,622
Per cent of pre-war	72.2	13.2	46.3

Coal Stocks at Coke and Steel Plants

WASHINGTON, April 17.—Complete returns from by-product coke and steel plants showed the following reserves on Feb. 1 and March 1, 1923:

	Days' Supply		
	March 1, 1922	Feb. 1, 1923	March 1, 1923
Steel Works:			
Steam coal	42	30	30
Gas Coal	56	23	23
Average	48	26	26
By-Product Plants:			
Low Volatile	55	16	17
High Volatile	34	21	19
Average	39	20	19

It will be seen that stocks at such plants changed but little during February and that coal was received at a rate about equal to the current needs. The supply on hand March 1 was nearly 22 per cent less than that on March 1, 1922, and 90 per cent larger than that on March 1, 1920. Stocks of by-product coke decreased 40 per cent in February and the quantity on hand on March 1 was but 87,000 tons. This was barely one-tenth of the heavy reserve stocks on March 1, 1922.

On March 1, commercial consumers had in storage approximately 36,000,000 tons of soft coal. The steady upward trend in stocks since the end of the miners' strike early in September was interrupted in February and the reserves on hand decreased 2,000,000 tons.

Coke Production Increases

UNIONTOWN, PA., April 15.—Coke production for the week ending April 7, continued to show an increase, despite the usual Easter lay-off, the production being 305,210 tons, an increase of better than 8000 tons over the preceding week. Of this output, 176,340 tons were produced at furnace plants and 128,870 tons were produced at merchant plants.

The production increase was brought about largely by increased efficiency at the various plants, no new ovens having been reported blown in. Increased car supply had considerable to do with the production.

Several companies are repairing beehive ovens long idle for resumption of operations. The J. Fred Kurtz interests, of Connellsville, are repairing 25 beehive ovens at Ferguson, near Dunbar, recently acquired by them, and these will be put in blast after being idle for 23 years.

The coke market softened considerably during the past several days but this is due in large measure to the embargoes which have been in effect on shipments to tidewater. The Pennsylvania still has its embargo on Greenwich piers while the Baltimore & Ohio is reported to have embargoed Curtis Bay, in part at least.

Cutlery, Edge Tools and Saws

WASHINGTON, April 16.—The Census Bureau figures for 1921 show 210 establishments engaged in the manufacture of cutlery and edge tools and 79 producing saws. In the former case there were 14,345 wage earners who turned out products to the value of \$49,341,000. The cost of materials was \$14,974,000, while the wages amounted to \$19,753,000. The wages were thus 32 per cent in excess of the cost of materials used. In 1919 the excess of wages over cost of materials in this industry was only 3 per cent, the materials having accounted for \$19,478,000 and the wages for \$20,048,000. In 1919 the total output was \$66,630,000, while in 1914 it was \$25,541,000.

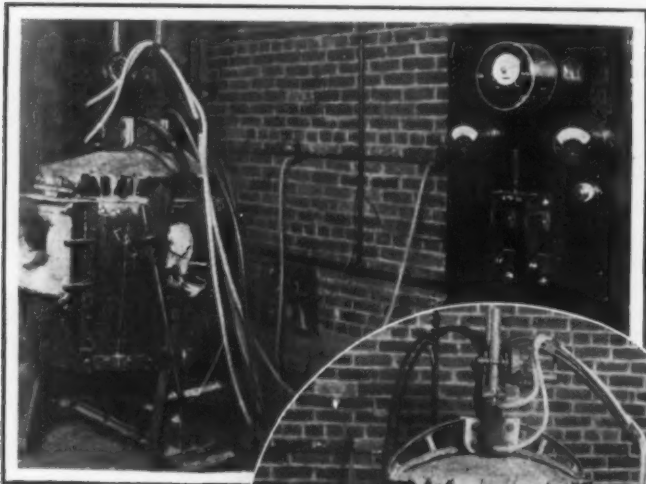
The output of saws in 1921 amounted to \$18,185,000, the number of wage earners being 3788. These figures compare with \$31,461,000 and 5510 wage earners in 1919, and with \$12,517,000 and 4560 wage earners in 1914.

Of the 210 establishments producing cutlery and edge tools in 1921, 46 were located in New York, 42 in Massachusetts, 25 in Connecticut, 20 in Pennsylvania, 19 in New Jersey, 15 in Ohio, 12 in Illinois and 4 or less in each of 16 other States. Of the 79 establishments making saws there were 11 in Illinois, 11 in Pennsylvania, 10 in Massachusetts, 10 in New York, 7 in Michigan, 7 in Ohio and 3 or less in each of 15 other States.

Small Electric Furnace for Quick Heats

To fill the demand for an electric furnace of small holding capacity which can be used for a variety of purposes, particularly when small quick heats of different mixtures are desired, and where ready control of the furnace and charge is essential, the Booth Electric Furnace Co., Chicago, has put on the market a furnace which will melt from 50 to 100 lb. of brass, iron or steel. It is especially designed so that the electrodes are arranged horizontally for melting brass and metals which volatilize readily and vertically for melting iron and steel.

No foundation is required for the furnace. It is mounted on trunnions so that the charging door and pouring spout may be brought to the proper height for charging and pouring. The furnace is tilted for pouring by turning a hand wheel. The operation is very



Electric Furnace for Melting 50 to 100 lb. of Metal. Electrodes are arranged horizontally for brass and metals which volatilize readily, and vertically for iron or steel

similar to that of the larger furnaces. Acheson graphite electrodes 2 in. in diameter are used. The electrodes are provided with nipple joints for continuous feeding and are water cooled. The general details of construction are indicated in the illustration. The lining of the furnace may be either basic or acid for melting iron or steel. If it is desired to melt iron and steel and also brass, an extra furnace shell and lining may be furnished so that there will be no contamination of the brass from the steel. The power required is 60 kw., 110 to 140 volts alternating current.

Construction work has begun on the Ford Motor Co.'s new engineering laboratory to be erected at Dearborn Mich., at an approximate cost of \$1,200,000, which will also house the Dearborn Publishing Co.'s offices and plant. It is to be of modern Renaissance design, 200 x 800 ft., with wings spreading from either side of the central section, each of which is 50 x 234 ft. and two stories high.

The Universal Portland Cement Co., the Steel Corporation's cement subsidiary, produced 13,168,000 bbl. in 1922, an increase of 669,000 bbl. over 1921. Of the country's total production for 1922, the company contributed 11.6 per cent. Since its organization in 1901, it has produced 146,378,407 bbl., nearly 10 per cent of the country's total over that period.

Wheeling Steel Corporation Becomes an Operating Company

Dissolution of the Wheeling Steel & Iron Co., LaBelle Iron Works and Whitaker-Glessner Co., subsidiaries of the Wheeling Steel Corporation, was formally approved at a meeting of the stockholders of these companies in Wheeling, April 10. By this action the Wheeling Steel Corporation, which has been a holding company, becomes an operating company. Most of the stock in the three companies was turned in and exchanged for stock of the Wheeling Steel Corporation about three years ago, when the consolidation was effected. But it was only recently that minority holdings of the stock in these companies were turned in, and meanwhile the companies had retained their charters and individual names. The Wheeling Steel & Iron Co. was incorporated in 1892. The Whitaker-Glessner Co. sprang from the Whitaker Iron Co., which was founded in 1875 and was incorporated in 1903. LaBelle Iron Works was incorporated in 1875.

Transition of the Wheeling Steel Corporation into an operating company means the automatic disappearance of the Wheeling Steel Products Co., formed to handle the sales of the three subsidiaries, and the functions of which are rendered unnecessary by the complete merging of the companies into a single unit. The annual meeting of the stockholders of the Wheeling Steel Corporation will be held in Wheeling, April 24.

Manufacture of Hardware

Census figures for the production of hardware in 1921 covered 430 establishments, in addition to 26 establishments making saddlery hardware. The value of products in the two cases amounted to \$116,689,000 and \$3,911,000, making a total of \$120,600,000. This may be compared with the total in 1919 of \$168,662,000 and in 1914 of \$77,360,000.

The total number of wage earners under the two groups amounted in 1921 to an average of 35,227, compared with 46,180 in 1919 and with 43,724 in 1914. Total wages paid amounted in 1921 to \$36,240,000 compared with \$49,274,000 in 1919 and with \$23,831,000 in 1914.

In each case the amount of wages accounted for approximately half of the value added to the materials through the manufacturing process, this value amounting in 1921 to \$79,080,000, in 1919 to \$105,846,000 and in 1914 to \$46,499,000.

Of the 456 establishments operating in 1921 there were 86 in Illinois, 79 in New York, 57 in Connecticut, 41 in Pennsylvania, 35 in Ohio, 32 in Massachusetts, 29 in Michigan, 29 in New Jersey and much smaller numbers in each of 19 other states.

Officers of the Elliott-Blair Steel Co., New Castle, Pa., effective April 30, will be as follows: Noah W. Elliott, president; Thomas C. Elliott, vice-president; Reuben J. Elliott, secretary; Noah W. Elliott, treasurer, and Elmer E. Elliott, general manager. The interests of George D. Blair and George D. Blair, Jr., were recently purchased by the Elliotts. The business was established by the Elliott brothers in New Castle in 1892.

An electric furnace for the production of steel castings and gray iron castings is being installed by the Vulcan Iron Works, Winnipeg, Canada. The new furnace will require about 1500 hp. of electric energy and will provide for individual castings up to 8000 lb. in weight.

Steel and Machinery Men to Attend the Foreign Trade Convention

The steel and machinery industries will send strong delegations to the Tenth National Foreign Trade Convention to be held at New Orleans May 2, 3 and 4.

The central theme of the convention will be "European Conditions Relating to World Trade," and the steel trade representatives will participate in the discussions based on the need of the return of Europe to a sound political and economic basis, as well as a variety of other subjects connected with the extension of American Foreign trade.

Among the delegates already registered are: James A. Farrell, president United States Steel Corporation; E. P. Thomas, president United States Steel Products Co.; William Whigham, vice-president Carnegie Steel Co.; Robert W. Wolcott, manager Lukens Steel Co.; Frank Baackes, vice-president and general sales manager American Steel & Wire Co.; John Hughes, assistant to president, United States Steel Corporation; A. W. Daniels, sales manager American Manganese Steel Co.; William Pigott, Pacific Coast Steel Co. and Pacific Car & Foundry Co.; Paul A. Ivy, general sales manager and Ralph R. Silver, manager of publicity, American Cast Iron Pipe Co.; W. P. Simpson, president C. T. Patterson Co., Ltd.; Robert L. Morris, Jr., president Austin Machinery Corporation of Louisiana, Inc.; Julius Goslin, president, Joubert & Goslin Machinery & Foundry Co.; John J. Markey, president and general manager National Wrought Iron Annealing Box Co.; James William Hook, president, Allied Machinery Co. of America; S. C. Markley, president Comas Cigarette Machine Co., and James S. Warren, foreign manager Remington Typewriter Co.

The following representatives of the automobile industry have registered as delegates: E. S. Zack, assistant to the general manager General Motors Export Co.; Frederick Dickinson, advertising and assistant sales manager, Hupp Motor Car Corporation; F. J. Johnson, sales manager, Ford Motor Co., and Burton C. Budd, general manager, Packard Motors Export Corporation.

Progress Shown in Standardization Work

Progress during the last year in standardization projects is indicated in the 1923 year book of the American Engineering Standards Committee, recently published.

Of the 35 standards thus far approved, the following are of chief interest to the metal industries: Pipe threads; safety code for the use, care and protection of abrasive wheels; National safety code for the protection of industrial workers in foundries; and safety code for power presses and foot and hand presses. A safety code for the protection of the heads and eyes of industrial workers was also approved. Specifications for both Bessemer and open hearth cold drawn automatic screw stock; specifications for both electrolytic and lake copper wire, bars, cakes, slabs, billets, ingots and ingot bars; and specifications for soft or annealed copper wire have been approved. Methods of chemical analysis approved include those for manganese bronze, gun metal and alloys of lead, tin, antimony and copper and also methods for battery assay of copper and laboratory sampling and analysis of coke.

Standardization projects to the number 121 were under way or had been completed at the end of the year. Two hundred and seventy-five national bodies—technical, industrial and governmental—are cooperating in the work of the committee, and more than 900 individuals are serving on the sectional committees, which carry on the actual standardization work, the American Engineering Standards Committee acting only as an administrative body. The development of a plan of cooperation between the Federal Specification Board, the body which develops the specifications for all government purchases, and the American Engineering Standards Committee, by which the specifications of the Board are submitted informally to the commit-

tee before definite adoption, is regarded as an important accomplishment of the year.

Several safety codes are among the projects which have an official status before the Committee. Other projects relate to the standardization of screw threads, ball-bearings, plain limit gages, machine tools and small tool elements, and gears. Specifications for welded and seamless steel pipe; welded wrought iron pipe; carbon-steel car and tender axles; carbon-steel and alloy-steel forgings; carbon-steel forgings for locomotives; axles, shafts and other forgings of quenched and tempered alloy-steel for locomotives and cars, are in view.

Specifications for galvanizing or sherardizing on iron and steel; specifications for carbon-steel and alloy-steel blooms, billets and slabs for forgings; and specifications for wrought iron plates; and for staybolt, engine bolt and extra refined wrought iron bars are also under consideration.

Cincinnati Meeting of Machinery Dealers

Cost conditions in machine-tool selling will be discussed at a session of the machine-tool section of the National Supply and Machinery Dealers Association in Cincinnati May 16, the day before the opening in that city of the triple convention of this association, the American Supply and Machinery Manufacturers Association and the Southern Supply and Machinery Dealers Association.

There will be a report by a committee appointed to confer with a similar committee from the National Machine Tool Builders Association. The committee representing the dealers' association include J. W. Wright, Colcord-Wright Machinery Co., St. Louis; H. G. Mitchell, Harron Rickard & McCone, San Francisco; G. H. Cherrington, Brown & Zortman Machinery Co., Pittsburgh, and L. H. Swind, Swind Machinery Co., Philadelphia. J. Wallace Carrel, president Lodge & Shipley Machine Tool Co., Cincinnati, J. B. Doan, president American Tool Works Co., Cincinnati, and Paul E. Thomas, president Kempsmith Mfg. Co., Milwaukee, are on the committee representing the manufacturers' association.

Meeting of Drop Forging Makers

A well attended meeting of manufacturers of drop forgings was held by the American Drop Forging Institute in Cleveland March 14. The advisability of preparing a safety code for the forging industry in cooperation with the American Engineering Standards Committee and the National Safety Council was one of the subjects considered, and it is expected that a committee will be appointed to consider the question.

Because of the present serious shortage of unskilled labor a resolution was adopted: "that this Institute hereby expresses its belief in the urgent necessity of a revision or repeal of the existing immigration laws to permit a greater percentage of unskilled workers to enter these United States and thereby alleviate the seriousness of the present labor famine, to permit necessary economic adjustment and to assist the free flow of production and commerce."

The report of the committee on cost accounting showed that progress had been made in the institute's campaign of accounting education. Scovell, Wellington & Co., Hanna Building, Cleveland, are commissioners.

Meeting of National Association of Purchasing Agents

The National Association of Purchasing Agents, with a membership of 4200 in the United States and Canada, will hold its eighth annual convention at the Hotel Winton, Cleveland, May 15 to 18, inclusive.

In connection with the convention there will be an "Informashow," a showing of merchandise and materials for the information of the purchasing agents. The association has sold 75 per cent of the space to 83 exhibitors.

METAL TRADES CONVENTION

President Coleman's Annual Report Considers Many Important Subjects

The twenty-fifth annual convention of the National Metal Trades Association was opened at the Hotel Astor, Wednesday morning of this week, by President W. W. Coleman, who, in his annual report, said:

"For 24 years—a generation almost—our association has an unbroken record of conscientious endeavor to promote and maintain harmonious relations in an industry which, during that period, has become one of the largest and most important in this country. It represents an aggregate investment of over \$11,000,000,000 and comprises about 30,000 plants employing approximately 2,000,000 people. It is the one great industry of our country which is operated almost exclusively upon the principles of the open shop."

President Coleman discussed many important subjects. In regard to contact with employees, he said:

Contact with Employees

"There must be some form of contact between the management and the workers which gives full opportunity for individual or collective dealing or a combination of both. The vast majority of manufacturing institutions in this country employ less than 100 men—94.3 per cent, to be exact, according to the 1920 census; only 0.4 per cent employ 1000 men or more. Surely the method of contact must necessarily vary between these two extremes. I do not believe that any rule can be made for this contact which will be uniformly successful. It will vary as the relations vary between management and workers in each individual establishment. In some of the larger ones we have seen works councils installed, in which the employees elect their representatives to deal with representatives appointed by the management. In some instances these have worked most successfully; in others they have been a complete failure. Whether they are successful or not, in my judgment, depends entirely upon the conditions existing in the individual organization. I am of the opinion that the best form of contact is through foremen who have been fully educated in the policies and spirit of the management, which they interpret to the men, and where full opportunity is given to the workers to express themselves individually or collectively to the foremen, or through the foremen to higher authorities, or directly to the highest executive."

Profit Sharing

As to profit sharing, Mr. Coleman said that most of the plans which he had observed resolved themselves into the presentation to the employees of gratuities. "There can," he said, "be no partnership between employer and employee unless they share equally in the responsibilities, the profits and the losses, and this sharing of anything but the profit is not a part of any scheme that I know of."

As to stock ownership by employees, Mr. Coleman said that it enables employees to become partners as investors. That such a partnership is of value there can be no question.

Reports of the other officers and of several committees were received Wednesday, and at the Wednesday afternoon session the following topics were discussed:

"The Old Government and the New Industry"—Hon. W. L. Huggins, Justice of Kansas Supreme Court, Topeka, Kan.

"Business Men and Politics"—Hon. Arthur R. Baxter, Indianapolis, Ind.

"The Law of Supply and Demand"—Dr. G. W. Dyer, professor of social science, Vanderbilt University, Nashville, Tenn.

"What Is the American Railroad Question?"—Robert S. Blinkerd, vice-chairman, committee on public relations, Eastern railroads, New York.

"Business and Government"—Dr. J. T. Holdsworth, vice-president, Bank of Pittsburgh, Pittsburgh.

The convention will be continued Thursday morning, when Sherman J. Lowell, National Master of Grange, Fredonia, N. Y., will speak on "The Labor

Problems of the Farmer," and Walter Gordon Merritt, counsel League for Industrial Rights, New York, on "The Legislative Program of American Federation of Labor."

New England Foundrymen's Association

Frank W. Brooks, chief engineer William Swindell & Brothers, Pittsburgh, was the chief guest at the April meeting of the New England Foundrymen's Association, held Wednesday evening, April 11, at the Exchange Club, Boston, which was attended by 81 members and friends. Mr. Brooks gave an illustrated and more or less technical talk on the application of electricity to various foundry operations, but particularly to melting, mold drying, core baking and heat treating. In his opinion the treatment of electric furnaces in terms of tons, such as a one-ton, two-ton, etc., capacity, is misleading. Mr. Brooks believes that capacities of these furnaces should be referred to in terms of inside diameter, measured in feet.

George A. Ray, president, presided at the meeting. Final plans for the May meeting were announced. Members of the association on the second Wednesday of that month will assemble at 2 p. m. at the General Electric Co., West Lynn, Mass., plant. The rest of the afternoon will be given over to an inspection of the foundry and affiliated plant units. Supper will then be served at the plant, following which H. M. Lane, consulting engineer, will deliver an address.

Southern Ohio Pig Iron Manufacturers Will Meet with Engineers

The Ohio Section of the American Institute of Mining and Metallurgical Engineers will hold a joint meeting with the Southern Ohio Pig Iron and Coke Association in Columbus, April 20. The program will include an automobile inspection tour to the plants of the Jeffrey Mfg. Co., the Buckeye Steel Cast Iron Co., American Rolling Mill Co., American Zinc Oxide Co., and International Derrick & Equipment Co. A complimentary luncheon will be served at 12.30 p. m. at the plant of the Jeffrey Mfg. Co., and at 6.30 p. m. an informal dinner will take place at the Southern Hotel, which will be followed by moving pictures of open-hearth steel furnace practice, coal mining operations and other industrial processes.

Convention of National Pipe and Supplies Association

Annual convention of the National Pipe and Supplies Association will be held May 15 and 16, in Cincinnati. Secretary George D. McIlvaine announces that Walter Gordon Merritt, associate counsel, League of Industrial Rights, will be one of the speakers and that his subject will be "Outstanding Tendencies of Industry." William A. Durgin, chief, Division of Simplified Practices, Department of Commerce, also is among the speakers. Headquarters of the convention will be at Hotel Gibson.

New York Steel Treaters April Meeting

Some practical considerations in the use of pyrometric thermocouples was the title of an address by C. H. Wilson, of the Wilson-Maeulen Co., New York, delivered before the New York Chapter of the American Society for Steel Treating at its April meeting, Wednesday evening, April 18. Blackboard illustrations were used and a round table discussion on pyrometry followed, with a consideration of such questions as "What Is the Matter with My Pyrometers?"

The Canadian Furnace Co., Port Colborne, Ont., after being down for 18 months, has completed extensive repairs and additions to its furnace and blew it in on April 2. The capacity of the furnace was increased from 300 to 350 tons per day. Among the additions made was the installation of a pig casting machine and gas cleaner.

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ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY

WILLIAM W. MACON

GEORGE SMART

C. S. BAUR, *General Advertising Manager*

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The Labor Aspect

Letters have come to THE IRON AGE in the past week from a dozen or more British mechanics in metal-working lines who would like to come to the United States. The widely circulated British *News of the World* recently quoted from THE IRON AGE as to the scarcity of men in various lines of metal trades work in this country. It was not strange that these British workmen, some of whom have gone months without employment, should sit down promptly and write as to the chance they would have in case they took ship for an American port. Most of those who wrote are molders. Others have had experience in locomotive, shipbuilding, boiler shop, electrical and general machine shop work. Some of them wrote that they knew scores of workers, sufferers like themselves, in the long siege of unemployment in Great Britain, who would gladly come to the United States if there were such opportunities of employment here as were indicated in the *News of the World* article.

Our answer to all these inquiries was in substance that while it is contrary to law for a manufacturer in this country to contract for the services of a resident in another country, the conditions here today, particularly at certain industrial centers, are such that if our correspondents were on the ground they would be quite sure to obtain employment. However, owing to the restrictions now in force, none of these men can be admitted to the United States before July, as the British quota for the year ending June 30 will be exhausted early in May, when the permitted total of 77,342 British subjects will have been landed. From all indications, the 20 per cent of the next fiscal year's quota, which is the maximum permitted for a single month, will be fully made use of in the British influx of July. If the men whose letters are before us are representative of the workers now coming in such numbers from Great Britain, these additions are of a class of men who have little in common with the radical undesirables at whom the restrictive legislation was aimed.

Most employers remember well the lessons they learned in 1919 and 1920 in the folly of bidding for workers employed at other plants in

the same city or even for men at work in other manufacturing districts. Today's situation differs by considerable from that of the two years just after the war, and yet here and there are indications, as spring comes on, of such efforts to increase working forces as are likely to start the old vicious spiral. If a working force that has seen few changes in the winter months is now broken in upon by the activities of employment agencies or of scouts from other manufacturing companies, two things are likely to happen—an increase of labor turnover and a decrease in production. The employer from whom men have been taken will proceed to recoup his losses by counter offers and meanwhile as his payroll goes up the breaking in of new men will send his per capita output down. The employer who sought to benefit at another's expense will find his apparent advantage dearly bought, for the process has a way of acting and reacting all along the line.

So far the disposition has been general to recognize the demands of the situation, and voluntary wage increases have been numerous—increases, in many cases, out of relation to advances in the product manufactured. The aim has been to do everything within reason that will tend to prolong the present activity. But we have no such robust prosperity as can withstand advances in labor costs by the spiral route, and the dangers of competitive bidding for workers should be fully appreciated while there is yet time to escape them.

That 1,645,237 men, as in 1922, did the work of 2,012,600, as in 1920, points to a marked increase in individual efficiency, other conditions being equal. This is the view of Julius Kruttschnitt, chairman of the Southern Pacific system, in a letter to Senator Couzens of Michigan. He drew on railroad records in answering the charge that \$1,000,000,000 reduction in a year in labor costs of railroad operation represented altogether decreased wages. Instead, he said, wage reductions accounted for \$350,000,000, leaving nearly two-thirds of the amount to be credited to economy and efficiency. It is the repeated cases of like efficiency, both in labor and management, that have made possible present high rates of produc-

tion in the face of labor shortage. In time, as in the past, the excess of jobs over men and the lack of wage stability may tend to break down the greater willingness to work and postpone the return of the honest dollar in labor and in the products of labor.

Steel Companies Were Right

At the recent trial of William Z. Foster on the charge of violating the Michigan criminal syndicalism law, he was asked by the Michigan prosecutor whether he would try to bring about a revolution by "armed insurrection and civil war" if he could not do so by the ballot. He replied, "I can't say." The jury was divided by a vote of six to six, and therefore, like the defendant, could not say whether he was guilty or not, as charged. But some facts developed at the trial have demonstrated beyond all question that the steel companies were right in refusing to confer with Foster at the time of the steel strike in 1919.

In THE IRON AGE of Sept. 25 of that year, it was declared in an editorial that "the present strike will not be settled by conferring with men whose teachings are hostile, not only to the present organization of industry but to all democratic government in industry and the nation." The strike was not settled by such conferring, but by ignoring all of the radicals; and after the lapse of several years the evidence in the Michigan court vindicates the position then taken.

Russell Porter, representing the New York Times, was present at the trial, heard Foster's testimony as to his beliefs and activities, examined the books, pamphlets and articles read into the record, and talked with the defendant for several hours. Mr. Porter has no ill-feeling toward Foster, and, in an extended review of the trial published by the Times of April 14, speaks in a kindly manner of Foster's personality, but of Foster's dangerous teachings, Mr. Porter makes this statement:

"The two principal planks in Foster's trade union program are amalgamation (or industrial unionism) and the organization of a labor party. He believes that the craft unions of the American Federation of Labor should be amalgamated into big, powerful unions, one to each industry. Instead of many unions in a given industry, with conflicting interests and rival leaders, that can be played off against each other, Foster argues that all the labor in an industry should have the same leadership, interests and objects. In the steel industry, for instance, he would have the workers combined in one organization, from the men who dig the coal and iron ore to the men who put the finished product into transit.

"Under such a system, he argues, their power would be supreme, they could enforce their demands easily, and when the time came could seize the industry and, cooperating with other industrial unions, supplant the present form of Government with the Soviet form, abolish capitalism and set up the dictatorship of the proletariat."

The above is a calm statement of a trained observer and is more important than a decision that in the opinion of a jury Foster was guilty as charged in the indictment. Whether he adheres to his old ideas of violence or not, he certainly does adhere to the revolutionary plan above described,

and the nation is indebted to an incalculable extent to leaders of the steel companies who took a firm stand against Foster and other radicals in the memorable days of 1919.

Solving Community Problems

An editorial published in THE IRON AGE some time ago suggested the communication appearing elsewhere in this issue, relating to efforts to contribute to the health and happiness of employees. It is unquestionably true, as stated in the editorial, that welfare work can be overdone and has been in some cases, and it is also true that it is well to encourage employees to do as much as possible for themselves. Certainly anything like patronizing should be avoided. It is difficult, however, to announce rigid rules for carrying on this work among employees.

The favorite argument of social reformers is that if men and women were adequately paid they would carry on their own welfare work. But experience has demonstrated that this is not entirely true, for no matter how high wages may be, there are some activities that are almost certain to be neglected. This is particularly true of hospital work, which would be sadly inefficient if no help were given by the employers. Some companies, especially when new plants are built, have found it absolutely necessary to establish hospitals, playgrounds and many other activities; but it has been their policy to give up the administration of these as rapidly as the people were willing to take them on. Sometimes this change has been made rather quickly and without friction, while in other cases the difficulties have been considerable.

If a company gives up participation in this betterment work, it is often a serious question whether an organization of outsiders, admirable as it may be in its motives, but lacking in acquaintance with the employees, will be able to function as satisfactorily as the company had done. Sometimes employees of these outside organizations are young college graduates with lofty ideals but with little or no practical experience; sometimes, also, ministers of the gospel, who have not been signally successful, are included among the employees, while occasionally agitators of the radical type succeed in obtaining employment. It is safe to say that an organization depending upon employees of these types would not be able to carry on the work in such a way as to obtain the best results.

It would appear that the individual community is in the best position to solve its own problems and that no general rule for the governing of all can be laid down.

Output of by-product coke in March was 3,256,000 net tons, making a new record for a month. The equivalent rate per annum is 38,300,000 tons. In presenting the March figure the Geological Survey states that it represents about 87.4 per cent of estimated capacity, it being understood that by-product plants cannot be expected to run continuously at the full rated capacity.

Production of beehive coke in March was 1,749,000 tons, the largest since 1920, and representing an annual rate of 20,000,000 tons. Thus coke production is at 58,000,000 tons a year, while the record output in a calendar year was the 56,478,185 tons of 1918. Proportional output now is 66 per cent by-product and 34 per cent beehive, against 46 per cent by-product and 54 per cent beehive in 1918, five years ago, and 27 per cent by-product and 73 per cent beehive in 1913, ten years ago.

Copper and Brass Records

Not alone in pig iron and steel were records made in March. The copper and brass industries made their contributions. It is estimated that more copper was melted by the brassmakers of the United States in March than in any month in the industry's history, not excepting the war period. Also in March deliveries of copper into consumption were equal to those of any month on record.

If iron and steel are broadly barometric, copper or brass are a measure of the soundness of business conditions and of widely ramifying activities. During the war vast quantities of brass and copper went into cartridge shells and other war materials. The volume was an index of intensive war effort. Today a similar volume of copper means a healthy demand for building and for electrical development and a long catalog of every-day uses. It means a broad expansion of business, a generally healthy condition of industry and a rising tide of prosperity.

Small Rail Output

A steel rail production of but 2,171,776 tons in 1922, or less than in 1921, shows the beggarly railroad buying of the year from another angle. The decrease is only a fraction of 1 per cent, but it is a decrease. Production of steel ingots, on the other hand, increased by about 75 per cent from 1921 to 1922. Rail exports were 321,822 tons in 1921 and 279,092 tons in 1922.

Production of rails under 50-lb. in section increased from 211,568 tons in 1921 to 265,541 tons in 1922, or 25 per cent, and this is a measure of industrial activity rather than of railroad buying.

The usual trend toward heavier section rails is seen in the 1922 statistics, since there was a sharp decrease in rails 85-lb. and up, but under 100-lb., and almost as great an increase in rails 100-lb. and over. For the first time the latter class exceeded the former, 902,900 tons against 728,604 tons, making a landmark in the employment of sections somewhat commensurate with the loads railroad track must now carry.

The Bessemer rail almost disappeared in 1922, the output being only 22,317 tons. It was not until 1911 that the open-hearth rail passed the Bessemer, but the passing was sharp and decisive, as much so as was the swing from iron rails to Bessemer steel rails from 1876 to 1877.

The industry of rerolling or restoring rails has not attained the size expected in some quar-

ters. Separate statistics of rerolled rail production have been gathered since 1911. The maximum was 155,043 tons, in 1913, but 1922 showed a gain over the preceding year, 116,459 tons against 96,039 tons.

Production of girder and high T rails has had remarkable fluctuations. As against 195,659 tons of this classification in 1913, there was a drop to 20,834 tons in 1918, while the 128,878 tons made in 1922 was the largest output since 1915 and showed an increase of 45 per cent over 1921.

Rails, once the great product of the steel industry, have become a minor item and undoubtedly they will remain so. Large additions to the track mileage of the country are ended, and the better the quality and the heavier the section the less the replacement will be. Last year's rail output was between 8 and 9 per cent of the total output of finished rolled steel. Bars, shapes, plates, sheets and wire rods may each be counted on to show a heavier tonnage than rails, while even the once insignificant tin plate was produced last year in two-thirds as great a tonnage as rails.

Protecting Workers' Savings

The arrests of sellers of Texas oil stocks have come none too early. With increased earnings of workers the activities of stock promoters have been redoubled, as is always the case when business is prosperous. Skilled salesmen have been going about in many industrial centers making a systematic canvass of employees of manufacturing plants and of others, of large means and small means, circularizing with the assistance of directories and telephone books and mailing lists, carrying their canvass even to the mill gates, and sometimes within them until they are ousted.

The States that have blue sky laws, compelling the registration of all brokers and the securities they offer, have rid themselves to a great extent of actual swindling operations conducted under the guise of stock selling. But the speculative stock cannot be kept out by law, even though there is nothing back of it but a few acres of land and the beginning of drilling operations. In fact, the blue sky laws are helping stock salesmen, for where the State issues the formal permit the broker in his selling talk may interpret it to be the State's official endorsement, a most convincing argument with many people.

Many industrial companies are helping their workers by trying to keep them out of the hands of this class of brokers. The men are urged to seek advice before investing their money. Service departments are placed at their disposal, to investigate the propositions offered them. It is brought to their attention that officials of the banks are always glad to give anyone, free of charge, the benefit of their knowledge as to securities. Warnings are posted in plants, sometimes going so far as specifically to name an undesirable stock. Yet case after case is reported of workers, women as well as men, who have swallowed whole the talk of a solicitor and have drawn out their money from the savings bank in the belief that it is certain to earn them rich returns in an incredibly

short time. The result usually is a total loss, sometimes of the savings of a lifetime.

Some owners are awake to the menace of example set their employees by men higher up. It is a common game of the seller of speculative securities to get prominent people to "take a flier," putting in money they can afford to lose, with full knowledge that it is a straight gamble. It is a form of dissipation with some otherwise conservative men.

Sometimes the name of a manager, a superintendent, a foreman, as a purchaser of stock, is used by the salesman as a talking point. With many good houses such speculation on the part of an official is frowned upon as a serious offense against discipline, as it should be frowned upon.

Vast good has been done in working against the speculation evil by proffering a safe and easy

way of investing money. Most notable in this direction, though not created for any one specific purpose such as this, are methods like that of the Steel Corporation in offering annually its stock to its employees, at a fair price, with bonus dividends and an additional bonus at the end of five years' holding of the securities. In a similar manner the system of cooperation between firms and the savings banks, for regular saving by employees, automatically serves to remove temptation.

Vigilance on the part of a management keeps down the speculation evil. It is not difficult to get reports of the activities of salesmen who are courting the workmen, and to discover the nature of their stock offerings. In some cases the police can act, in others a bulletin notice helps, and personal talks may do the rest.

CORRESPONDENCE

Community Recreation for Employees

To the Editor: The experience of a growing number of industrial communities indicates that recreation and welfare activities for employees are likely to be more efficient if carried out in the community independent of company control. As pointed out in a recent article in THE IRON AGE, entitled "Is Welfare Work Overdone?" company control of welfare activities may defeat its own ends and bring discontent rather than contentment and efficiency. This difficulty is avoided and at the same time successful and well received activities are carried on through a plan of recreation and Americanization under the auspices of the community at large.

An example of such a plan is Whiting, Ind., where a community committee under the name of Whiting Community Service has been carrying on its program since 1919. This organization is made up of representative Whiting citizens, including professional people, employers, employees and others. It is affiliated with Community Service, Inc., a national non-commercial agency which helped establish the Whiting work and has given similar help to some 170 cities and towns. It has no religious, fraternal or financial affiliations. The Whiting program includes athletics, girls' and boys' clubs, playgrounds, Americanization classes, social games, community music and dramatics. The director and three assistants are paid from funds democratically raised by public subscription.

One important advantage of the Whiting scheme is that all activities are conducted strictly on an amateur basis. The objective is not to secure finished professional performers who entertain the thousands, but to give the thousands a taste of wholesome and recreating activities which will inspire them to be regular participants in various forms of play.

There can be no charge of paternalism against a community recreation program, a complaint from which factory welfare work is not always free. Employees not only help to control the community program, but they contribute to it voluntarily in service and from their pocketbooks. If they do not wish to participate in the activities, they do not feel obliged to.

Recreation on the community plan is popular because the participants take part in it not as employees but as neighbors and friends. The fun nights at the community center, the soccer football contests, skating carnivals and other activities do not bear the label of any manufacturing industry. Employees from one factory like to associate with those from another and with people from all walks of life.

Community recreation may actually encourage plant

loyalty through the fostering and management of inter-plant athletic contests and other forms of rivalry. The opportunity to belong to and root for one's own factory team has furnished a basis for plant *esprit de corps*.

Another advantage is that because employees are represented on the recreation committee they are able to work cooperatively with employers and others for the town in a cause in which the interests of the employees and employers are one, a condition making for better feeling between employee and employer.

In larger cities and towns the community plan may command the use of the recreational facilities and resources of the entire community, whereas the factory program is limited in its scope almost entirely to the resources within the industry.

It is just as important to make the community at large attractive for the employee as to make the factory attractive. It is in the community that the workers have their leisure time interests, their families, homes and friends. Community recreation tends to reduce migration from one community to another, since workers desire to remain in a place which provides adequately for spare time. Contentment and permanence are factors making for good citizenship and for a minimum labor turnover.

The recreation and general welfare of the people are of such importance that they should not be attached in an incidental way to the industrial machine from philanthropic or business motives. The leading representatives of all elements in the community should take responsibility for providing leadership in the community's spare time and should promote recreation for its own sake and for the physical, moral and social benefits which will accrue.

W. W. PANGBURN.

New York, April 16.

The Numbering of Drawings

To the Editor: It would seem to be the easiest thing to do to number drawings in straight numerical order; yet, strange to say, there seem to be more than the famous 57 varieties in the systems of numbering that are found on drawings in one's files. Some firms use systems that are complex and difficult for an outsider to understand; this should not be so, for in this day, when drawings must accompany the work, they should be numbered so that anyone could understand them. They should be simple to avoid the mistakes that are likely to happen when they are the least complex. When a drawing number carries with it a dash, the latter is very likely to be omitted, in which case it might be difficult to correct an error.

After nearly twenty-five years' experience in handling drawings, during which time we have handled prints from scores of manufacturers, we had some come in the other day that were complex in the extreme.

They came from an engineering company that had changed from a simple system to the complex. The system adopted may have seemed to be just what the company wanted, but think of the mistakes likely on account of it, not only in the company's offices, but with people with whom they may be doing business. Think how easily it may be for some stenographer when writing a drawing number, such as "F4-13-25," for instance, to leave out either one or both of the dashes and thus run two of the numbers of the key together. Drawing numbers should be as nearly foolproof as it is possible to make them, and that means to use straight numbers without the troublesome dashes.

After years of experience I have found that some person is very likely to ignore even the letters that often prefix the numbers, but this is not so bad, providing numbering in the system does not overlap; that is, if only one lot of consecutive numbers are used and is not duplicated for each size of sheets, such as usually carry the letters of the alphabet.

Some of the large electrical manufacturing companies, as well as the job engineering concerns, have a system that appears to be of straight numbers, but keyed in such a way that only those who are acquainted with it can tell what each unit stands for. This system leaves out the troublesome dash. It is very much like the system of numbering employed by shoe manufacturers; it is understood only by the shoe salesman.

The system used of having a single set of numbers, regardless of the sheet size, is a good one; then the various sheets may be designated as A, B, C and so on. Should a customer neglect to give the letter the correct drawing may always be found. Where each letter designates the drawer for the particular sized sheet and where each drawer begins with No. 1 for the drawer and No. 1 for the sheet in the drawer, the trouble is that some customer may fail to mention the letter.

To our engineering department orders would come in from some department or from some jobbing shop, calling for a drawing by giving a number but omitting the initials of the subsidiary company. Since we devised the plan of setting aside a group of numbers for each plant we have had no trouble. Each block of thousands has a definite representation. The old numbers were not destroyed but simply were prefixed to the required number of thousands.

A system that might meet the requirements of one firm might not do at all for another in a different line of work; but each could devise a simple method, where the same number would not be repeated. The simpler any system is the better.

H. W. WEISGERBER,

File clerk, Engineering Department, Youngstown Sheet & Tube Co., Youngstown.

Supply of Higher Silicon Pig Irons

To the Editor: Your very interesting editorial on "Higher Silicon Pig Irons" in the current issue of THE IRON AGE has been read by us as sellers of iron with interest.

Of course, it is sometimes impossible to make spot shipment of any particular grade of iron—and it is true that the lower silicon irons have been in much greater supply than the higher silicon; yet there never has been a time in the past five years but with a few days' notice, we could have supplied the foundryman, who inspired the editorial, with a reasonable amount of high silicon iron at the market prices. It looks to us as if the gentleman in question probably needs to be informed as to where best to buy his iron.

JAMES A. GREEN,

Cincinnati, April 14. President, The Matthew Addy Co.

The United States Civil Service Commission announces an open competitive examination for automotive engineer. The receipt of applications will close on May 22. The examination is to fill a vacancy in the position of ordnance engineer at the Aberdeen Proving Grounds, Aberdeen, Md., at \$5,000 a year.

MOLDING SAND RESEARCH

Important Progress in Methods of Testing to Be Reported at Cleveland

Most opportunely the work of the Joint Molding Sand Research has been aided by a contribution of \$1,000, just received by Chairman R. A. Bull from the American Foundry Equipment Co. No addition to the fund had been made since the original amount of \$4,300 was voted for this purpose by the directors of the American Foundrymen's Association. It is estimated that \$9,000 will be needed to complete the work laid out.

The Joint Committee on Molding Sand Research now has two research engineers in its employ and will soon have another. These engineers supplement the part time work of the 24 sub-committee members and of other investigators not on the joint committee who have collaborated at many foundries and at the laboratories of the Bureau of Standards, Cornell University and the University of Illinois.

A vast amount of work has been done in developing satisfactory methods of testing. Many varieties of sand have been used, and their behavior in some cases showed interesting phenomena. Methods of testing have been conditionally approved and are now under final review. It is hoped that announcement can be made at the American Foundrymen's Association convention at Cleveland, early in May, of testing methods tentatively adopted by the joint committee for one year's trial. The methods are divided into two classes—essential and supplementary. The former are for determining bonding strength, cohesiveness, permeability and fineness. The supplementary methods are for the determination of dye adsorption and for making chemical analyses.

The sub-committees on conservation and reclamation and on geological surveys have been busy also, and they are expected to present reports at the Cleveland convention.

The joint research was organized by the American Foundrymen's Association, assisted by the National Research Council. The work was started in December, 1921. The American Society for Testing Materials has three members on the committee, the Bureau of Standards has a like number, and the Bureau of Mines, the Navy Yard at Washington and the Canadian Department of Mines are all officially represented. There are 48 members of the joint committee, and the personnel is exceptionally strong. Ten are metallurgists and physicists of high standing, six are steel foundrymen, six are malleable foundrymen, six are gray iron foundrymen and five non-ferrous foundrymen. Five are geologists, six are sand producers and six are refractory and ceramic experts.

The committee reports, which will be presented at the two molding sand sessions at the Cleveland convention, are looked forward to with particular interest.

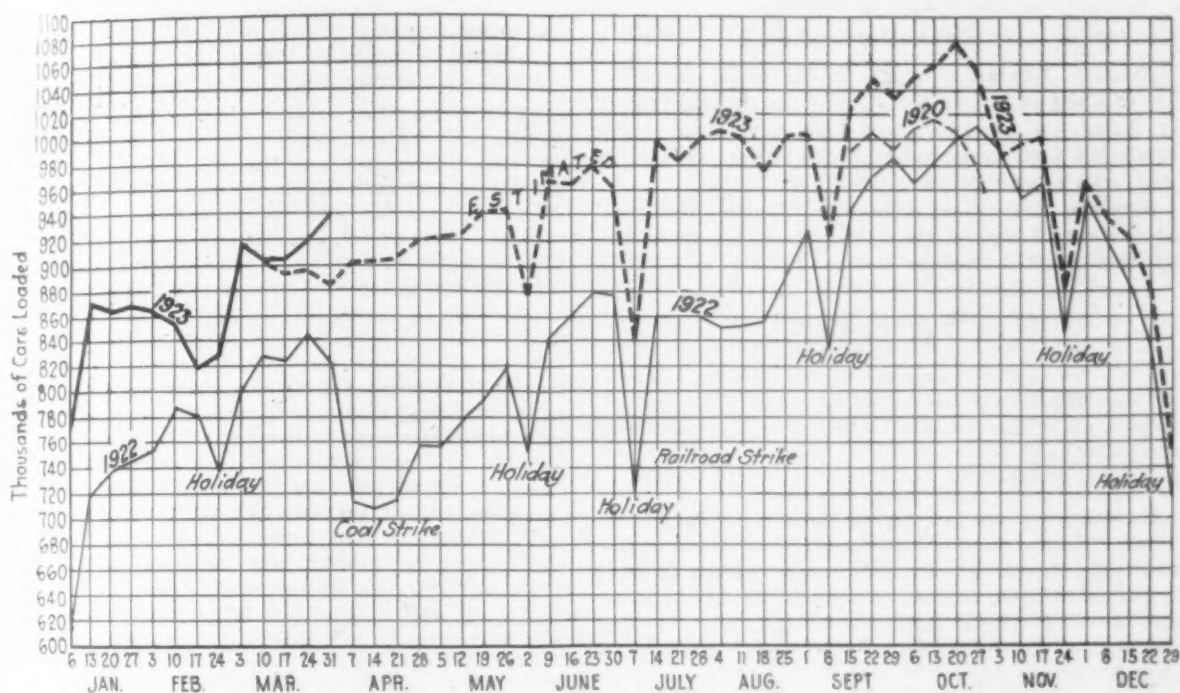
Contracts for Heat Treating Equipment

The Hupp Motor Car Co. has decided on a duplicate installation of heat treating furnaces at Jackson, Mich. Each part will be composed of a heating, quenching and drawing unit, each part 75 ft. in length. There will also be an automatic continuous normalizing furnace, a heat treating furnace, a cyanide treating furnace and a standard hearth type treating furnace. Oil fuel will be used. The plant is to be installed by F. J. Ryan & Co., Philadelphia.

The Reading Hardware Co., Reading, Pa., has contracted for an annealing furnace for cast iron, a furnace for rustproofing, a carbonizing furnace, three electric core ovens, ten oil fired brass furnaces and an automatic electric dipping and japanning furnace, also to be installed by F. J. Ryan & Co.

The Champion Rivet Co. of Cleveland has announced a 10 per cent wage advance.

Railroad Traffic Indicates Heavy Production Movement



FIGURES quoted by the American Railway Association show that in the thirty-seven weeks from July 1, 1922, to March 17, 1923, more freight cars were loaded with revenue freight than in any similar period in our previous history. The number is given as 32,939,789 cars, which exceeds the large totals of both 1919 and 1920, and is far ahead of any of the war records.

In the diagram on this page the record of week by week loadings for 1922 and the first thirteen weeks of 1923 are shown as reported. The heavy dotted line carried across from March 10 to the end of the year shows the expected business as estimated by the American Railroad Association.

April 5. From the curve it will be noted that the actual record of the three weeks subsequent to the beginning of the estimated curve has gone well above that curve. What the record will be at the end of the year remains to be seen.

A strong effort is being made to get a daily movement per freight car of 30 miles, associated with an average loading of 30 tons. This would mean 900 ton-miles per day per freight car in use. The actual figures for the three months of September, October and November last were 25.9 miles per day and 27.7 tons per car, making a total of 717 ton-miles, or less than 80 per cent of what is wanted. It is

estimated that if the 900 ton-miles had been reached during those three months, it would have been equivalent to adding 523,039 freight cars to those in service.

In addition to showing the 1922 and 1923 curves, a small portion of the 1920 curve, in September and October, is shown. This period furnished the highest single week's railroad movement in our history. Yearly peak loadings for the past five years have been:

1918, Sept. 23 week....	989,788 cars
1919, Sept. 23 week....	995,901 cars
1920, Oct. 14 week....	1,018,539 cars
1921, Oct. 21 week....	964,811 cars
1922, Oct. 28 week....	1,014,480 cars

DEMAND LESS URGENT

Iron Makers in the Youngstown District Not Being Pressed So Hard

YOUNGSTOWN, April 17.—There is less urgency for deliveries than was manifested a month ago, excepting for pipe, and buyers are in most cases well protected. Another factor in the situation is that second quarter tonnage is largely contracted for, and mills have not yet opened their books for third quarter or last half deliveries.

Demand continues well sustained and even heavy for the smaller sizes of steel pipe, used chiefly in construction, for wire products, strip steel and plates.

Pressure buying of pig iron has disappeared, due largely to increased production and the blowing in of additional merchant stacks. Consequently the supply of merchant iron is in improved volume. Railroads are now making better deliveries of scrap, an influence which is also easing this market. In the Valleys, basic and Bessemer pig iron continues at a nominal \$31 level, though higher prices have been paid on occasional sales.

Automobile makers are pressing for third-quarter requirements, but mills are slow to commit themselves at a fixed price at this time. Strip steel and full finished sheets are among the products which are feeling, in particular, the stimulus of demand from the automobile industry.

In the strip market, the situation is such that producers can to a large extent choose their own specifications. In the main, they are holding down their forward obligations, so as to be in position to take advantage of turns in the market.

Hot-rolled strip is now minimum at 3.50c. for the ordinary widths, while the narrower gages command up to 3.75c. The 3.50c. minimum compares with a 2.90c. base before the sharp upward swing commenced. Cold-rolled strip is firm at a 5.25c. minimum, with prices varying up to 5.50c.

In the tin plate market, demand is less urgent, due to the fact that mills are largely sold ahead over the first half and are not yet inclined to open their books for second half.

New Factory Nearly Ready

Two new factory buildings which the Truscon Steel Co. is erecting at its plant on Albert Street in Youngstown will be completed in June. The company has manufacturing equipment to install in the buildings which will partly occupy them. The steel joist equipment, purchased by the Truscon company from the Central Steel Co., Massillon, Ohio, will not be removed to Youngstown at the present time, as it is operating at Massillon. It is planned to later set up this equipment in Youngstown. The Truscon company is operating at capacity and reports capacity business well into the third quarter.

GERMAN STEEL PRICES DROP

Slight Reduction Is First Since February 21—Gold Value Has Increased

(By Radiogram)

BERLIN, GERMANY, April 16.—Foundry iron No. 1 is unchanged at 616,300 m. per metric ton (\$29.74 per gross ton, at 4.75c. per 1000 m.). This price, established last week, replaced 648,300 m. (\$28.98 at 4.4c.) which had prevailed since Feb. 24.

For the first time since Feb. 21 the Stahlbund has made a change in the prices of steel ingots, bars and thin sheets. Ingots become 728,000 m. (\$35.13 at 4.75c.) in place of 749,000 m. (\$33.84 at 4.4c.); bars are now 1,012,000 m. (2.18c. per lb.) in place of 1,043,000 m. (2.08c.); thin steel sheets are now 1,596,000 m. (3.44c. per lb.) in place of 1,649,000 m. (3.29c.).

[On page 1056, last week, we showed in a table and in a chart the course of these prices over the past year.]

It is stated on the authority of the *Bergwerks Zeitung*, Essen, that production in the Ruhr at the end of March was about three-fourths of normal and that about 40 per cent of what was being produced could be sold within the occupied territory. Blast furnaces in the Ruhr have enough ore on hand to last 6 months or more.

March Steel Castings Sales Record

WASHINGTON, April 17.—A new high record in sales of commercial steel castings was established in March, according to the Bureau of the Census of the Department of Commerce. The bookings of orders for commercial steel were reported by the Steel Founders' Society from companies comprising over two-thirds of the commercial-castings capacity of the United States. The March total was 30 per cent greater than the previous high record in March, 1920, with both railroad specialties and miscellaneous orders making new high marks. Total bookings reported in March were 143,564 tons by firms with a capacity normally devoted to commercial castings of 96,900 tons, or at the rate of 148.2 per cent of capacity, as against February bookings at 93 per cent of capacity. Bookings of railroad specialties amounted to 76,409 tons, or almost 200 per cent of capacity, as against 104 per cent for February bookings. Bookings of miscellaneous castings amounted to 67,155 tons or 114.6 per cent of capacity, as against 85.8 per cent for February bookings, and, for the first time, bookings of miscellaneous castings exceeded capacity devoted to that class of castings.

New Books Received

Machine Tools and Their Operation. Part I and Part II. By Fred H. Colvin and Frank A. Stanley. Pages, Part I, 341; Part II, 409; 6 x 9 in.; illustrated. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price \$8.

Handbook of Steel Erection. By M. C. Bland. Pages 241, 4 x 6½ in.; 39 illustrations. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, \$2.50.

Problems in Machine Design. By O. A. Leutwiler. Pages 140, 6 x 9 in.; illustrated. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, \$1.50.

Design of Machine Elements. By J. A. Mease and G. F. Nordenholt. Pages 237, 6 x 9 in.; 101 illustrations. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, \$2.50.

The Swedish Year-Book 1922. Pages, 253, 5 x 7¼ in.; illustrated. Published by Almquist & Wiksell Co., Ltd., Stockholm, Sweden.

BOOK REVIEWS

Petroleum Register: January edition, 1923; 432 pages, 8½ x 11½ in., published by Oil Trade Journal, 350 Madison Avenue, New York. Price, \$10.

This is the first of the semi-annual editions of a publication which has heretofore been issued annually. The compilation covers information on more than 11,000 companies and individuals engaged in all branches of industry connected with petroleum. There are more than 600 items of equipment and supplies carried in the Buyers' Guide section. In addition, there is an alphabetical index at the back covering 26 pages.

Besides, to the large amount of directory service carried, including trade names, associations, books on subjects allied with this industry, etc., the statistical section of 24 pages and the map section of 23 pages deserve mention. One of the most interesting tables in the statistical section is that devoted to the year by year production of petroleum in the world, beginning with 1857. For that year and 1858, the entire production, consisting respectively of 1977, and 3560 barrels, came from Roumania. The United States entered the field in 1859 with 2000 barrels against Roumania's 4349. In 1860, however, the United States took a tremendous leap to 500,000 barrels and has never since produced less than half of the entire world's output. Mexico first entered the production columns in 1901. Not until the slump in Russia in 1918, however, did Mexico reach second place. The Mexican total in 1921 is about one-quarter of the world's total, while the United States produced 61 per cent of the total. Russia stood third with about 4 per cent.

In the map section the locations of the fields in each producing State of the United States is shown, both with regard to oil fields and gas fields, while the course of pipe lines is traced across each State, where these are a factor. Foreign maps include Argentina, Canada, Colombia, Mexico and Venezuela.

Hendricks' Commercial Register of the United States. Thirty-first, 1923, edition. Pages 2482, 8½ x 11 in. Published by the S. E. Hendricks Co., Inc., 70 Fifth Avenue, New York. Price, \$15.

This volume, which is revised annually and which with its monthly supplement is intended to provide a complete and up-to-date information service, has been expanded to the extent of 150 pages over the 1922 edition. The changes and additions number upward of 125,000.

The classified lists are for buyers and sellers, and include the electrical, engineering, machinery, chemical, building and other industries. The radio trades have been compiled and classified, and several of the former lists have been revised and re-grouped.

More than 18,000 products are separately classified in the new volume, the names and addresses of manufacturers appearing in alphabetical order under the classifications. The trade name or brand of the product is also given, and a separate section of the book has trade names arranged alphabetically with the name and address of the manufacturer following. All names of manufacturers and others appearing in the register are arranged alphabetically in a separate section of the book, as well as appearing in the separate classifications of the products they make or handle.

Little need be said as to the merits of this register, as it has now reached its thirty-first annual issue and is widely known and used.

On page 1040 of the April 12 issue of THE IRON AGE reference was made to the large blast furnace of the Trumbull-Cliffs Furnace Co., Warren, Ohio, having a hearth measurement of 22 ft. 6 in. This was an error; the figures are the dimensions of the bosh.

Chairman Gary Addresses Annual Meeting

Gives Views on Dividends, Immigration, Prices, Wages
and Other Subjects—May Speak Later on
Conditions in Europe

AT the annual meeting of the United States Steel Corporation, held in Hoboken, Monday, April 16, Chairman Elbert H. Gary spoke on a number of subjects. Some of his remarks were in response to questions from stockholders. The retiring directors, George F. Baker, Jr., William J. Filbert, Samuel Mather, Thomas Morrison and John S. Phipps, were reelected for three years.

Judge Gary stated that the properties of the corporation had increased in value more than a billion dollars since the incorporation of the company. He added: "The officers hope that the stockholders will get some benefit as result of this growth, but we make no promises." He said he would rather be accused of being a little too slow in acting than be charged with having made a promise that was not kept.

Referring to the immigration law, Judge Gary said he regarded it as one of the worst things this country had ever done as to its economic future, for labor is plentiful abroad and would come to this country if permitted to do so. It was not his purpose to talk about his trip to the Near East at this time. He added, "If I say anything on this subject, as I may, it will be at the spring meeting of the American Iron and Steel Institute next month."

Employees as Stockholders

"In my judgment," said Judge Gary, "the only proper way to give an employee a chance to become associated with the affairs of the company is through a stock interest. As a result of this he is jointly responsible for what happens to the company and this makes him a better employee. Such a feeling can be created through stock ownership as in no other way."

Prices and Wages

Judge Gary said that the corporation could not control prices on labor conditions. Prices are made by sellers and purchasers together. Labor is governed by the willingness of a man to work at certain prices and the consent of the employer to pay that price.

Judge Gary said that if the corporation could do what it would like to do it would always demand and receive fair prices for what it produces and never let prices go so high as to be extortionate, and so with labor. It would always pay labor what it considered a fair rate. He also said that the corporation never tried to get into a position where it could ask more or pay less than was considered fair.

In explaining the attitude of the corporation regarding the stockholders' interests, Judge Gary said that the directors and officers never forgot the interest of the stockholders. "Dividends may not be as large as you would like to have them or wages as high as employees would like to have," he said, "but the management has them always in mind. Some stockholders think we have too large a surplus and should pay larger dividends."

"No one has given this more consideration than I have," said Judge Gary. "Our surplus is large, but much of it is invested in properties necessary to retain our position in the competitive trade. As a result of business expansion there is more need for working capital. No new mortgages have been created by the company, but some bonds have been issued under old mortgages for improvements and betterments. The company has plenty of cash to carry on its business and does not have to go to the bank and pay high interest on money temporarily loaned. The company kept its cash account a little ahead, so as to be able to pay dividends when earnings were not sufficient to

cover such payments. In these respects we have managed our business as the stockholders would if they were in the place of the officers."

Work for Employees

Judge Gary then referred to the welfare work carried on by the corporation. He said that the Steel Corporation treated its men better than any other large corporation in the world. This was not due to a spirit of benevolence, but was due to two reasons. First that it was because they ought to be treated so and second because it paid. He said the efficiency of the men at the present time was better than at any period since the war and this was due to the belief that they are being treated right and that their superior officers took an interest in them. The men were satisfied, he added, and would always be satisfied if it were not for the uncalled-for and unjustified interference of outsiders. They cause a temporary disturbance, he said, but it isn't lasting, as the men generally decide rightly on questions concerning their welfare.

Prominent Stockholders

Among the stockholders as shown by the company's record are: George F. Baker, 58,550 common and 500 preferred; William J. Filbert, 1312 common and 1346 preferred; Samuel Mather, 801 common; Thomas Morrison, 1001 common and 4000 preferred; Richard V. Lindabury, 68 common and 200 preferred; William P. Palmer, 351 common and 1019 preferred; Percival Roberts, Jr., 1 common and 110 preferred; Robert Winsor, 500 common and 1 preferred; George F. Baker, Jr., 1 common; Eugene J. Buffington, 1081 common and 1386 preferred; James A. Farrell, 2787 common and 4350 preferred; Elbert H. Gary, 3757 common and 5279 preferred; Emma T. Gary, 11 common and 3769 preferred; J. P. Morgan, 105 preferred; Woodrow Wilson, 47 preferred; E. H. Gary and Richard Trimble, 125,457 common and 39,209 preferred. These blocks of stocks are understood to be the securities held by the corporation for employees who purchase the stock under the partial payment system. Another block of 61,000 shares of common stock is held in the names of E. H. Gary and F. M. Waterman. A number of large blocks are held by brokers.

Valley Scrap Prices Receding

YOUNGSTOWN, April 17.—Prices of scrap metals entering into iron and steel production are gradually receding from recent high levels. Heavy melting, for instance, is quotable to melters and other consumers at \$26.50 to \$27, with dealers offering about \$1 per ton less. Recently sales were made at the peak prices in the current movement of \$28 at Youngstown and \$28.50 at Massillon.

Hydraulically compressed sheets are down proportionately with heavy melting steel, and are quotable at \$24 to \$24.50 per ton. There has been a lull in buying, and even at the lower quotations, there is no rush on the part of the melters to cover their requirements.

Work has been started on a 23-story bank and office building at Broadway and Liberty Street, New York, which will be known as the Westinghouse Building. All the space above the eleventh floor will be occupied by the Westinghouse Electric & Mfg. Co. and its subsidiary and affiliated organizations.

EXPORT MARKET QUIET

Orient Hesitates to Buy Much at Present Prices— Tin Plate Bought Here and in Japan

NEW YORK, April 17.—Inquiries from foreign markets for iron and steel are becoming less numerous and, as a rule, smaller. The Far East particularly has quieted down to a few merchant inquiries and very little municipal or governmental buying. A large part of the present merchant inquiry from Japan is for special material, such as hoops, tin plate, electrical sheets, zinc sheets, screw stock, etc. The Nippon Oil Co., which asked for bids on 16,500 boxes of tin plate, awarded the tonnage to the Mitsubishi Shoji Kaisha for delivery in the fourth quarter; quotations ranged from \$5.50 to something under \$6, per base box, Pittsburgh. In addition to this award, the Nippon Oil Co. is reported to have placed another, probably smaller, tonnage of tin plate with the Japanese office of Suzuki & Co., to be filled out of that company's warehouse stocks.

China continues fairly active, but purchases are generally small. Inquiries call for prices on tin plate, wire shorts, second-hand material, cold-rolled hoops, copper, galvanized sheets, wire, etc. One exporter dealing exclusively with Chinese markets reports having recently submitted bids on about 180 tons of electrolytic copper, of which about 60 tons was purchased and the remainder is still pending. Buyers of copper in China are inclined to delay purchasing in expectation of lower prices in the American market. The present level of prices in the United States is evidently somewhat of an obstacle to Chinese buying.

One exporter to China was able to offer a price 30c per 100-lb. under the current market on an inquiry for a small tonnage of cold-rolled hoops, but it was apparently too high to interest the Chinese buyer. Some tin plate has been bought, and a seller to China has been able to close on a small tonnage of resale material at \$6.10 per box, f.a.s. New York, a basis of about \$5.45 per box, Pittsburgh.

China has improved as a buyer of iron and steel since the conclusion of the Chinese New Year celebration, last month, but until political conditions are sufficiently settled to enable municipalities and large enterprises to obtain foreign credit and investments, little more than the present merchant buying on a small scale is expected by exporters to this market. As an example of the need of foreign capital and credits, there are the Harbin tramways, which, when financing is available, will be in the market for about \$3,000,000 worth of electrical equipment and nearly \$2,000,000 worth of rolling stock.

Foreign Rail Business

Purchases of rails by foreign railroads are temporarily quiet. At present there are no new inquiries of any size in the market from the Far East, but there are prospects of buying from other markets. The Chilean State Railways, 141 Broadway, New York, are now opening bids on about 200 tons of bars and shapes and before long will probably issue a tender for their usual requirement of heavy rails. The Ulen

Contracting Co., 120 Broadway, New York, building about 128 miles of railroad through Bolivia, reports having received last week the tonnage of rails purchased for this work in Belgium. Despite conditions in Western Europe, the Belgian mill's delivery was only two weeks later than promised in the contract.

The Ulen company is shipping about 20 small girder bridges purchased in the United States. Two small Mikado type locomotives purchased from the American Locomotive Co. are being used in constructing this railroad, and as the work progresses the contractor may purchase further rolling stock.

Inquiries from European markets appear sporadically, but seldom seem to develop into business. A large export interest in New York reports having received requests for bids on tin plate from both Sweden and Italy in the past fortnight. The Swedish inquiry asked for quotations and offered to pay a bonus. Neither inquiry specified the tonnage required.

Operation of the deferred duties on certain products has been further postponed until Sept. 30, 1923, says a report of the Department of Trade and Customs of the Commonwealth of Australia. The materials affected by this postponement of duties include: Hoop iron and steel; iron and steel plates and sheets, both plain and tinned; iron and steel tubes; chains and cutlery.

Various Construction Enterprises

The Bolivian tin mining industry is becoming more prosperous every day, says a recent report of the American consul at La Paz. The price of tin is now about £188 per ton of pure tin, compared with an average of £159 in 1922. An American company is reported to be planning a mill with a capacity for treating 200 tons of ore per day, which would be the second largest in Bolivia. There is a persistent rumor that a Bolivian capitalist, who controls the largest tin mines in the country, has sold out to American interests.

Electrification of several hundred miles of railroads in the south of England and the Midland counties will result from a plan being undertaken by the British railroads. The two routes on which immediate work of electrification is planned will provide about 122 miles of electric road, and these will form the basis for more extensive electrification in the future. It is estimated that three years will be required for completion of the work.

The Government has approved the construction of a grain elevator by the Montreal harbor commission, says a report from Canada to the Bureau of Foreign and Domestic Commerce. The first section, which is to cost \$2,347,000, will be started soon. The elevator will have an ultimate capacity of 10,000,000 bushels. An enlargement of the former Grand Trunk grain elevator costing about \$750,000 will also be undertaken.

The Fourth Annual Fair at Bandoeng, Java, will be held from July 28 to Aug. 12, says a report of the Netherlands Indian Government, New York office, 44 Beaver Street. In connection with the fair will be held the first aircraft exposition in the Orient. Rates to American firms exhibiting may be obtained from the New York office of the Netherlands Government.

INFLATION NOT FEARED

Treasury Officials Comment on Chairman Schwab's Remarks

WASHINGTON, April 17.—Commenting upon the statement made yesterday by Chairman Charles M. Schwab, of the Bethlehem Steel Corporation, in which he sounded a warning against inflation, high Treasury officials today said that they saw no signs of such a trend. They called attention to the high Federal Reserve ratio, the fact that production is entering immediately into consumption and that, therefore, there are no stocks being accumulated which might otherwise later mean liquidation of heavy inventories. It was understood that Secretary of the Treasury Mellon has been the recipient of letters from various sections and interests of the country which have intimated the fear

that over-expansion and inflation are in sight and seeking the opinion of Mr. Mellon regarding the matter.

It was declared that the Secretary has invariably stated that he has seen no sign of inflation and no prospect of a buyers' strike because of prices. It was further said the Secretary has pointed out that over-expansion is prevented by the limitations of transportation and the supply of labor. The Secretary also is said to feel that caution being exercised by the manufacturing interests against unduly high prices tends to stabilization and continued prosperous conditions.

Treasury Department officials again took occasion to say that there is no contemplated action in the near future on increasing rediscount rates. Business generally accepts advances in rediscount rates as a form of restraint on high commercial rates, but it is claimed that the latter are being kept well in bounds and indicate lack of speculation in the business world today.

PURCHASING PRECEPTS

Extracts from Address of C. Frank Schwep, Emphasizing Value of Expert Salesman

Purchasing problems were recently discussed at a meeting at Athens, Pa., by C. Frank Schwep, general purchasing agent of the Ingersoll-Rand Co., New York. Some of his observations were as follows:

A capable purchasing agent is one who is familiar with the science of buying in all its phases. It is necessary for him to know practically as much about the commodity he is buying as the salesman who sells it. When it is remembered that the salesman of today usually has expert knowledge of the line of goods he is handling, you can better understand how difficult a task it is for the buyer to hold his end up with the seller.

Intelligent buying has been elevated to a science owing to the fact that selling has been specialized; and the purchasing agent who does not make use of the fund of knowledge broadcasted by the salesman will soon find himself at a disadvantage.

It is not necessary to tell you where to buy, because the purchasing directories and trade publications can do that to perfection. The carefully prepared indexes and advertisements enable the buyer to find just what he wants among a score or more of

manufacturers and dealers. Be careful, however, to deal with only reputable houses. Half of your trouble will be avoided by steering clear of the irresponsible kind.

In any well-organized purchasing department there will be found a carefully compiled list of concerns to whom to apply for any commodity or article that might be required. These firms have been tried and tested and can be relied upon for fair and square dealing. Make friends with the houses you patronize and remember that your contact with them can build up a feeling of good-will that will be an invaluable asset in the settlement of any differences that might arise. The purchasing department is constantly in touch with the outside commercial world, so it devolves upon it to maintain the ideals, the reputation, and traditions of the firm of which it is a part.

It is difficult to lay down any set rules for purchasing. "How to buy" is an art that cannot be taught. It must be learned by practice. Proficiency depends upon experience, judgment and intuition. So many factors enter into purchasing problems that only by elimination can we find the elements that carry weight.

Speculating with the materials market is just as dangerous as speculating with the stock market. When prices are low it is safer to buy farther ahead than when prices are high, but having a high-priced market no conservative buyer will invest heavily with the expectation of prices going still higher.

Technical Program for Spring Meeting of American Electrochemists

The feature of the program of the spring meeting of the American Electrochemical Society, which is to be held in New York on May 2 to 5, is the symposium on the "Production and Application of the Rarer Metals." The chairman of this symposium is F. M. Beckett, Carbide & Carbon Co., New York, and through his personal solicitation the papers which are to be presented were obtained. The program in detail is as follows:

"Present Status of the Production of Rarer Metals," by C. James.

"The Preparation of Fused Zirconium," by H. S. Cooper.

"Experiment with Rare Metal Steels: U, B, Ti, Zr, Ce, and Mo," by H. W. Gillett and E. L. Mack.

"Inherent Effect of Alloying Elements in Steel," By B. D. Saklatwalla.

"Preparation of Metallic Uranium," by R. W. Moore.

"Experiments Relative to the Determination of Uranium by means of Cupferron," by J. A. Holladay and T. R. Cunningham.

"The Preparation of Platinum-Rhodium Alloy for Thermocouples," by R. P. Neville.

"Investigation of Platinum Metals at the Bureau of Standards," by Edward Wichers and Louis Jordan.

"Some Notes on the Metals of the Platinum Group," by R. E. Carter.

All the sessions of the convention are to be held at the Commodore Hotel, with the registration scheduled for the evening of Wednesday, May 2.

On Thursday morning, May 3, a session will be held on "Electrode Potentials," of which William G. Horsh is chairman. At 3 p.m. of the same day another technical session is scheduled on miscellaneous purely electrochemical problems:

The third technical session is scheduled for Friday morning, May 4, and among the papers scheduled are the following:

Presidential Address, "Opportunities of the American Electrochemist Abroad," by Carl G. Schluederberg.

"E. G. Acheson and His Work," by F. A. J. Fitz Gerald.

"The Electrodeposition of Nickel on Zinc," by A. Kenneth Graham.

"The Effect of Iron in the Electrodeposition of Nickel," by M. R. Thompson.

"Notes on the Electrodeposition of Iron," by H. D. Hinde.

"Notes on the Metallurgy of Lead Vanadates," by Will Laughman.

An excursion to Westport is scheduled for Friday afternoon, May 4, to inspect the research laboratories of the Dorr Co. Leaving the Grand Central Terminal at 12:03 o'clock, the members will be the guests of the Dorr Co. at luncheon, and there will be an excellent opportunity for playing golf at the Westport Country Club. A complimentary dinner, followed by a dance

at this club, is scheduled for Friday evening at 6 o'clock.

An unusually attractive program has been prepared for the entertainment of ladies. Also on Thursday noon a complimentary luncheon is to be tendered the members and guests of the society by the McGraw-Hill Co. 10th Avenue and 36th Street, New York, followed by an inspection of the McGraw-Hill plant.

The Growth of India's Steel Industry

The expansion of the iron and steel industry of India in recent years has been marked. Data recently prepared by the National Federation of Iron and Steel Manufacturers of Great Britain show that the pig iron and steel output, including castings, was as follows for the period 1914-21 in gross tons:

	Pig Iron	Steel Ingots and Castings
1914.....	234,726	66,603
1915.....	270,027	103,474
1916.....	246,553	131,092
1917.....	251,648	163,955
1918.....	264,662	183,642
1919.....	319,984	186,902
1920.....	312,439	156,239
1921.....	371,062	182,690

The steel output has had almost a threefold expansion in the period reviewed, or from 66,600 tons in 1914 to 182,690 tons in 1921. Pig iron has not increased in proportion to steel, but throughout the eight years there has been a very considerable production of foundry iron. In 1918 the output of ferromanganese and spiegeleisen reached its maximum at 13,313 tons. In 1921 it was 3076 tons, or the largest total for any peacetime year.

Nearly all the ingot output has been basic open-hearth steel. Castings cut a small figure. Of the 1921 total 181,204 tons was ingots and 1486 tons castings. The total finished steel output of the country has been as follows in gross tons:

	Finished Steel	Finished Steel
1915.....	68,634	120,451
1916.....	91,493	123,968
1917.....	105,039	110,311
1921.....		121,634

This steel is almost entirely consumed in India. While British exports of steel to India were 83,000 tons per month in 1913 they were only 36,000 tons per month in 1921. In 1922, however, there was an increase to 49,400 tons per month. The starting up recently of a large tin plate plant near the Tata works is only one more sign of the importance of India's steel industry to the country itself and its possible effect on trade with Great Britain.

Iron and Steel Markets

THE PACE MODERATING

Buyers Less Disposed to Pay Premiums to Get Steel

Cotton Tie Price for 1923—Fabricated Business Less Than in March

There is increasing evidence of moderation in prices of finished steel and in the attitude of buyers. Pressure on the mills is just as great, but there is less offering of premiums to get early delivery steel and less effort to place contracts covering third quarter months.

The Steel Corporation's operations continue at 93 per cent or somewhat better, and independent companies have made a slight increase in their recent running rate. It is appreciated, however, that the test is yet to come of the ability of steel companies to hold their forces intact in the face of the high wages offered for some forms of outdoor work.

Some manufacturing consumers of steel also are paying considerably less for common labor than are the building trades, and the effect of this inequality is yet to be seen. Foundries, too, are short of men because of the high rates paid by outdoor jobs.

Early delivery plates, shapes and bars have sold in the past week at prices somewhat below the extremes of two and three weeks ago, and with this tendency there is less concern over the possibilities of speculative buying.

The shortage in semi-finished steel is unrelieved, but as the finished material market is quieting down, mills that buy their sheet bars or billets are less exercised. An Ohio mill having its own steel supply is trying to buy 8000 tons of sheet bars, but none is offered.

A few price changes are yet to come in connection with new buying for forward delivery. Some pipe producers look for higher prices, but the Steel Corporation's policy is not yet made known. There is an expectation that wire products of the Steel Corporation will find a higher level.

The Carnegie Steel Co. opened its books this week for cotton ties for 1923 at \$1.60 per bundle of 45 lb., as against \$1.10 last year. Other makers have adopted the \$1.60 price, which is nearly equivalent to 3c. per lb. for steel hoops.

Fabricated steel business is not running at the rate of March, but that month established a high point, with sales aggregating 235,000 to 240,000 tons. The past week's known contracts totaled 25,000 tons and inquiries 17,000 tons.

The week's railroad equipment business is a surprise, seeing how much is booked ahead. Purchases of cars exceeded 6300 and there were 83 locomotives.

New steel rail inquiry, chiefly in the Chicago district and the South, amounts to 250,000 tons, and some of it has been booked by Steel Corporation mills which cannot deliver before late in the year. Chicago mills have taken large orders for

track fastenings, including 30,000 kegs of spikes and bolts, 5000 tons of angle bars and 1200 tons of tie plates.

Automobile buying of alloy steels has been considerable, and recent minimum prices cannot now be had, one maker's advance being as much as $\frac{1}{4}$ c. per lb.

Steel foundries had a remarkable month in March. Practically two months' capacity of railroad castings were ordered and about 15 per cent over rated capacity in miscellaneous commercial castings, or 143,564 tons of both classes. It was by a wide margin the best month in three years.

Buyers of pig iron have been almost entirely absent from the market, making the dullness more pronounced than for a long time. On the whole, prices are being well maintained and strength is shown in some centers, particularly in the Chicago district. Some concessions have been made at Buffalo and in Virginia.

Two advances of \$2.50 each in the price of British ferromanganese have come in the past week, bringing it to \$120, Baltimore. High fuel and high ore are the reasons.

Eastern iron ore companies have made some sales, but are meeting strong competition in foreign ores and prices have not been definitely established. Lake Superior producers are selling rather slowly at Cleveland.

Suspensions of a number of Pittsburgh district coal mines because of low prices has halted the decline. Coke production is still in excess of contract requirements and with export business held up by car congestion in the East, low prices have been made, to move the surplus. Furnace coke has been offered at \$6 and in a few cases sold at \$5.50.

Some of the coke sold to Europe in the Ruhr emergency may not go out of the country. Time limits in connection with payments may expire before the freight congestion on the seaboard can be relieved.

THE IRON AGE pig iron composite price stands this week at \$30.79, compared with \$30.86 for the four preceding weeks. One year ago it was \$20.40.

Pittsburgh

Conservative Policy Still Prevails—Pig Iron Extremely Dull

PITTSBURGH, April 17.—The spirit of moderation which recently appeared in the iron and steel situation continues to spread, but beyond an abatement of the feverish demand for supplies without much regard for price, general conditions are little altered. Conservation utterances of leaders of the steel industry in which they have stressed the danger to business from higher prices are bearing fruit. Premiums for delivery have not disappeared entirely, but the amount of such business no longer is at all heavy and in view of the apparent opposition of the large producing interests to higher prices, which is taken to mean that speculative purchases will not be profitable, that sort of buying has stopped. Moreover, the large steel companies are looking out pretty well for the requirements of their regular customers and usually at very reasonable prices

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Apr. 17, 1923	Apr. 10, 1923	Mar. 20, 1923	Apr. 18, 1922
No. 2X, Philadelphia...	\$32.76	\$33.14	\$33.14	\$25.40
No. 2, Valley furnace...	31.00	31.00	31.00	21.00
No. 2, Southern, Cin'ti...	31.05	31.05	31.05	20.50
No. 2, Birmingham, Ala...	27.00	27.00	27.00	16.00
No. 2 foundry, Chicago*	32.00	32.00	32.00	21.00
Basic, del'd, eastern Pa...	30.25	30.25	30.00	21.50
Basic, Valley furnace...	31.00	31.00	31.00	20.00
Valley Bessemer, del. Pitts.	32.77	32.77	32.77	22.96
Malleable, Chicago*	32.00	32.00	32.00	21.00
Malleable, Valley...	31.00	31.00	31.00	20.50
Gray forge, Pittsburgh...	32.27	32.27	32.27	22.71
L. S. Charcoal, Chicago...	36.65	36.65	36.15	26.00
Ferromanganese, furnace...	125.00	125.00	120.00	65.00

Rails, Billets, Etc., Per Gross Ton:

O-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$40.00
Bess. billets, Pittsburgh...	45.00	45.00	45.00	29.50
O-h. billets, Pittsburgh...	45.00	45.00	45.00	29.50
O-h. sheet bars, P'gh...	47.50	47.50	45.00	31.00
Forging billets, base, P'gh	52.00	52.00	52.00	34.50
O-h. billets, Phila...	50.17	50.17	50.17	35.24
Wire rods, Pittsburgh...	50.00	50.00	50.00	38.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb...	2.35	2.35	2.35	1.50
Light rails at mill...	2.25	2.25	2.25	1.50

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.825	2.825	2.825	1.86
Iron bars, Chicago...	2.60	2.60	2.50	1.65
Steel bars, Pittsburgh...	2.50	2.50	2.35	1.50
Steel bars, Chicago...	2.84	2.84	2.35	1.60
Steel bars, New York...	2.84	2.84	2.69	1.88
Tank plates, Pittsburgh...	2.50	2.50	2.35	1.50
Tank plates, Chicago...	2.84	2.84	2.50	1.60
Tank plates, New York...	2.84	2.84	2.69	1.88
Beams, Pittsburgh...	2.50	2.50	2.35	1.50
Beams, Chicago...	2.84	2.84	2.45	1.60
Beams, New York...	2.84	2.84	2.69	1.88
Steel hoops, Pittsburgh...	3.30	3.30	3.30	2.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, April 17, 1923, Finished Steel, 2.810c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets	April 10, 1923, 2.810c. March 20, 1923, 2.710c. April 18, 1922, 2.084c. 10-year pre-war average, 1.689c.
These products constitute 88 per cent of the United States output of finished steel	

Composite Price, April 17, 1923, Pig Iron, \$30.79 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham	April 10, 1923, \$30.86 March 20, 1923, 30.86 April 18, 1922, 20.40 10-year pre-war average, 15.72
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compared with those which have been paid for specified deliveries.

An advance in pipe prices is pretty generally looked for, since this product has advanced relatively less than practically all other lines, and present quotations are claimed to be too low measured by today's costs. It is also expected that the leading interest will announce higher prices for sheets and tin plate when it opens its books for third and fourth quarter business, as its present prices are considerably below those of the independents and also are out of line with costs. It is barely possible that in the pending adjustments, prices of wire goods will find higher levels than now are quoted by the Steel Corporation wire making subsidiary. In other directions prices are regarded as high enough and the effort of the industry now is plainly to stabilize them.

Although steel plant operations in this district have not been seriously affected by labor shortages, it is believed that such a development is ahead because it is expected that a good many men will be tempted away from the mills by the more remunerative wages of other kinds of work. The wage increase to steel plant workmen which became effective yesterday does not seem to be finding reflection in price advances, but is being

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Apr. 17, 1923	Apr. 10, 1923	Mar. 20, 1923	Apr. 18, 1922
Sheets, black, No. 28, P'gh.	4.00	4.00	3.75	3.15
Sheets, galv., No. 28, P'gh.	5.25	5.25	5.00	4.15
Sheets, blue an'l'd, 9 & 10	3.25	3.25	3.00	2.40
Wire nails, Pittsburgh...	2.90	2.90	2.80	2.40
Plain wire, Pittsburgh...	2.65	2.65	2.65	2.25
Barbed wire, galv., P'gh...	3.70	3.70	3.45	3.05
Tin plate, 100-lb. box, P'gh.	\$6.00	\$6.00	\$5.50	\$4.75

Old Material, Per Gross Ton:

Carwheels, Chicago	\$27.50	\$28.50	\$28.50	\$19.00
Carwheels, Philadelphia...	26.00	27.00	27.00	16.00
Heavy steel scrap, P'gh...	25.50	26.00	26.50	16.50
Heavy steel scrap, Phila...	23.00	24.00	26.00	14.00
Heavy steel scrap, Ch'go...	22.00	23.00	24.00	13.75
No. 1 cast, Pittsburgh...	28.00	28.00	28.00	17.00
No. 1 cast, Philadelphia...	26.00	27.00	29.00	17.50
No. 1 cast, Ch'go. (net ton)	25.50	26.50	27.00	15.00
No. 1 RR. wrot, Phila...	28.00	28.00	28.00	16.00
No. 1 RR. wrot, Ch'go. (net)	20.50	20.50	21.00	12.00

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt...	\$6.00	\$6.25	\$7.50	\$5.00
Foundry coke, prompt...	7.00	7.75	8.50	5.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	17.25	17.37 1/2	17.35	12.87 1/2
Electrolytic copper, refinery	16.75	17.00	17.00	12.62 1/2
Zinc, St. Louis...	7.35	7.45	8.00	4.90
Zinc, New York...	7.70	7.80	8.35	5.25
Lead, St. Louis...	8.15	8.15	8.25	4.95
Lead, New York...	8.25	8.40	8.25	5.15
Tin (Straits), New York...	45.30	46.50	49.25	31.00
Antimony (Asiatic), N. Y.	8.25	8.50	8.75	5.00

put forth as a reason why there should be no price decline. Shortage of semi-finished steel still is unrelieved, but with a less excited market in finished products there is not the anxiety of non-integrated mills to secure tonnages.

It has been another extremely dull week in pig iron and if there is a definite trend to prices, it is downward. The scrap market has eased off a little further since a week ago and a further decline in coke prices due to the fact that production still is going ahead of demand, has put the market more than \$1 a ton below the average price of second quarter contract tonnages.

Ferroalloys.—Two advances, each of \$2.50 per ton, have been announced by British makers of ferromanganese, whose minimum price for third or fourth quarter deliveries now is \$120 c.i.f. Atlantic seaboard, duty paid. Such tonnages of British material as are in the country and available for delivery between now and July 1, are priced at \$125. The position of domestic makers is firmer although they have made no change in prices. They still are quoting \$125 for delivery between now and July 1, \$120 for the smaller tonnages of last half business, and \$115 for last half where the inquiry calls for a sizable tonnage, and shipments will be accepted as the tonnage is produced over the last six

months of the year. Demand for ferromanganese has increased somewhat in the past week, but still is far from active, as consumers generally are well fortified against their requirements until July 1. As high as \$100 delivered is being quoted on 50 per cent ferro-silicon, but \$95 is as high as any sales have been made in this district. Demand for spiegeleisen is moderate, but available supplies are very limited. There is no change in Bessemer ferrosilicon or silvery iron prices. A few small sales are noted at quotations. Prices are given on page 1143.

Pig Iron.—It is doubtful whether the week's business here amounted to as much as 2000 tons. Buyers are showing marked indifference about their third quarter requirements and the largest inquiry for early delivery now before the market is for 1000 tons of Bessemer for a local steel foundry. The market still is quotable at \$31, Valley furnace, for No. 2 foundry, basic and Bessemer iron, since producers generally are holding to that price, but it is admitted that only carload lots can be sold at that figure. Merchant furnace interests, however, are well enough off in the matter of orders to be disinclined to force sales at the moment.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.77 per gross ton:

Basic	\$31.00
Bessemer	31.00
Gray forge	\$30.50 to 31.50
No. 2 foundry	31.00 to 32.00
No. 3 foundry	30.50 to 31.50
Malleable	31.00
Low phosphorus, copper free.....	36.00

Iron and Steel Bars.—Some of the irregular producers of steel bars still are quoting and obtaining 2.75c. base or more for tonnages for early delivery, but sales at such prices are dwindling, in view of the fact that the larger producers are taking on more business from their regular customers and this at prices which range from 2.35c. to 2.50c., base, Pittsburgh. The New York Central Lines has deferred purchases of bars in which local mills bid 2.35c. and 2.45c. An effort is under way to establish an extra of \$3 per ton for screw stock bars. It is claimed that in the production of such bars costs run up pretty high because of the extra labor involved. The change, if made, could not become immediately effective, since the mills are sold so far ahead. There is no change in iron bars.

We quote steel bars rolled from billets at 2.35c. to 2.75c.; rail steel reinforcing bars, 2.25c. to 2.35c.; refined iron bars 3.25c. in carloads, f.o.b. mill Pittsburgh.

Wire Products.—General conditions show no special change. The effort of all makers is to get rid of present obligations before taking on fresh ones, and as the demand still is strong, much more business is being turned down than is being entered. It is possible that the supply situation will get slightly easier in the next few weeks with the completion of shipments against the spring agricultural demands, which have taken precedence in deliveries, and of course, much wire away from other products. Shortage of common labor is hampering mill operations and also deliveries since much of this kind of help is necessary in loading. There are still several price lists, but they are not especially significant since so many producers virtually are out of the market at the present time. The full range of prices is given on page 1142.

Steel Rails.—The market on light rails still is quotable at 2.25c., base mill, for those rolled either from billets or old standard sections. Demand still is steady rather than brisk.

We quote 25 to 45-lb. sections, rolled from new steel, 2.25c. base; rolled from old rails, 2.25c. base; standard rails \$43 per gross ton mill for Bessemer and open-hearth sections.

Semi-Finished Steel.—Business suffers from a lack of supplies rather than a lack of demand. Some producers have begun to accumulate ingots as labor shortages are restricting blooming mill operations, but this does not help the semi-finished supply situation in the least and buyers still find it extremely difficult to unearth tonnages of billets, sheet bars or slabs. Recent

inquiry for 10,000 tons of billets which was for the Connors Steel Co., Birmingham, still is believed to be open and the Atlantic Steel Co., Atlanta, also is understood to be seeking a large tonnage of billets, chiefly for conversion into cotton ties. As nearly as the market on these forms can be appraised, it is quotable between \$45 and \$47.50, but there have been no recent sales. Quotations on other forms of semi-finished steel also are nominal in the absence of sales, on account of a dearth of offerings. Prices are given on page 1143.

Tin Plate.—Business continues quiet. Export sales are reported as high as \$6.50 per base box, Pittsburgh, and on a few small lots to domestic consumers for delivery between now and July 1, \$6 has been done. Generally buyers are well covered against their requirements for the remainder for this half year and by the same token the mills are sold up for that period. Buyers are showing some interest in third quarter requirements, but not much business for that delivery has been entered since independent mills are waiting on the price announcement of the American Sheet & Tin Plate Co. Such an announcement is expected shortly, but it is extremely doubtful that the corporation will give recognition to the prices which lately have been obtainable on small lots for early delivery.

Cold-Finished Steel Bars and Shafting.—Business still is good although lacking some of the feverishness that it recently had. March was a big month both in production and shipments, and consumers are more comfortably supplied than they were recently. Current shipments are invoiced well below present quotations, although some makers last month succeeded in reducing their low-priced obligations by setting time limits on the acceptance of specifications, and cancelled much tonnage on which specifications were not forthcoming. A further advance in prices is under consideration based on the fact that the present differential between hot-rolled and cold-finished bars is claimed to be too small for profit. On carload lots the market still is quotable from 2c. to 2.10c. base, Pittsburgh, with ground shafting at 3.40c. base, f.o.b. mill, for carload lots.

Sheets.—Much of the excitement which recently characterized the demand has disappeared in the past week or so and buyers, already well covered against their requirements for the second quarter of the year, now show a disposition to hold back a little on third quarter orders pending the announcement of the leading interest, expected in the near future, as to its third quarter prices. This interest is expected to advance from its present bases of 2.65c. for blue annealed, 3.50c. for black and 5c. for galvanized, but it is considered doubtful that it will advance to anywhere near the prices now being obtained by independents for specified deliveries. Labor and steel shortages, to say nothing of the effect of car shortages, have hindered the leading interest in reducing its obligations, and it is possible that it will have very little tonnage to offer for third quarter shipment. Prices are given on page 1142.

Tubular Goods.—Effective April 12, several makers of charcoal iron boiler tubes advanced prices \$12 per ton by reducing the discounts by six points. It is stated that this advance is due to increased labor and raw material costs. Makers do not profit much by the advance since generally they have several months' production already booked which carries the old prices. Current prices are only slightly below the war and post-war peaks and the opinion is expressed that at the new levels buyers are likely to become rather cautious to avoid being caught with large stocks in the event of a change in the other direction. Intimations are heard of a possible advance of \$6 per ton in seamless steel tubes, but as yet nothing definite has developed, except that one producer already very heavily sold up, quoted an advance of \$10 per ton over regular quotations to avoid additional bookings. Lap welded steel tubes are unchanged and repeated predictions of higher prices for steel and iron pipe have not yet been fulfilled. The pressure for shipments of pipe still is very heavy. Discounts are given on page 1142.

Structural Material.—Local indications are that April will be a much lighter month in structural lettings than last month, and there is a growing belief that the peak was reached in March, since high labor costs are likely to lead to the postponement of a good many projects. The situation in plain material still is very firm, with few mills in a position to promise deliveries short of 60 days. There is less buying than recently for quick delivery and consequently premium business is lighter. Plain material prices are given on page 1142.

Plates.—Pressed Steel Car Co. is in the market for 17,000 tons of plates. This inquiry is believed to be in connection with 1000 hopper coal cars recently placed with that company by the Virginian Railway. Altogether these cars will require approximately 20,000 tons of steel above the trucks. Occasional sales of plates for very prompt delivery still are being made up around 2.75c. and 3c., mill, but on such business as local and nearby mills are taking from regular customers, prices run from 2.45c. to 2.50c. The New York Central Lines has deferred purchases of plates, for which it recently asked bids, although the prices named were the present day minimum figures. Prices are given on page 1142.

Hot-rolled Flats.—The market still is quotable at 3.30c. to 3.50c., base, Pittsburgh, on the ordinary gages and widths, but on account of the high cost of steel and the recent increase in wages, some makers will not take on new business at the lower figure. A number of mills are sold up for the present quarter and are out of the market, being disposed to reserve some tonnage for regular customers who have not been in a position to send along specifications. The Carnegie Steel Co. yesterday opened its books for the season on cotton ties, naming a price of \$1.60 per bundle of 45 lb., with a carrying charge of 1c. per bundle per month, beginning July 1. This price has been adopted by other makers. The price compares with \$1.10 a year ago, \$1.35 and subsequently \$1.30 in 1921, \$2 in 1920 and \$1.70 in 1919. This season's price figures out to the equivalent of about \$3 per 100 lb. of steel hoops, this price being \$6 per ton below the currently quoted price.

Cold-rolled Strips.—High cost of steel and increased labor charge involved in the recent wage advance are beginning to be reflected in prices. A number of makers are now quoting 5.50c., base, Pittsburgh, but the former base of 5.25c. has not entirely disappeared.

Bolts, Nuts and Rivets.—Local bolt and nut makers report business as good, but make no claims that any considerable part of it is at to-day's published quotation. Specifications for rivets are coming in well, but most of the business is at the lower quotations of the published range. Prices and discounts are given on page 1142.

Track Fastenings.—Railroads are specifying well against old orders and are doing a fair amount of fresh buying in connection with the laying of tracks, which is now getting actively under way. There has been no change in prices since a week ago. Quotations are given on page 1142.

Coke and Coal.—Suspension of a number of mines in this district on account of low prices seems to have halted the downward tendency of coal prices, but the production of coke still is running greatly in excess of contract requirements and, with export business still largely cut off, low prices have had to be named to move the surplus. Standard furnace coke for spot shipment today is freely offered at \$6 to \$6.25 per net ton, at oven, and some "distress" tonnages actually were sold as low as \$5.50. Standard foundry coke for spot shipment was quotable today from \$7 to \$7.50 per net ton, at oven, with some sales as low as \$6.50 of loaded cars which had to be moved if the producer was to secure additional cars. Very little interest is yet apparent in third quarter or last half tonnages of either grade, buyers being inclined to hold off now that the indications point to lower prices than prevailed on first and second quarter contracts. Demand

for coal has not improved sufficiently to bring about any advance in prices. We still quote the spot market on mine run steam coal from \$1.85 to \$2 per net ton at mines and mine run gas and coking coal from \$2.50 to \$2.75. Some lake business is reported in lump steam coal at \$2.50, but the lake business generally is getting away to a slow start.

Old Material.—The market has yielded another 50c. per ton on heavy melting steel on sales aggregating approximately 10,000 tons, to a Pittsburgh district melter, who paid \$26 for a part of the tonnage but only \$25.50 on the bulk of it. In spite of this dip, however, the market does not reflect much weakness and few look for any pronounced decline from this level. The railroads are offering large tonnages of scrap and dealers who have much tonnage due them on old low-priced orders claim that shipments are heavy. These considerations, however, are not exerting as much influence upon prices here as the continued absence from the market of the leading local independent steel maker and the fact that other steel companies are buying only as supplies are required and then it happens that no two mills are in the market at one time. Compressed sheets bring relatively high prices because an increasing number of mills are taking this grade in preference to paying a higher price for heavy melting steel and getting material of very poor quality. There have been a good many rejections of turnings lately because of the presence of large percentages of scale in the shipment and the loss has been charged to shippers.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$25.50 to \$26.00
No. 1 cast, cupola size	\$28.00 to 28.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; and Franklin, Pa.	28.00 to 28.50
Compressed sheet steel.....	24.50 to 25.00
Bundled sheet sides and ends....	23.50 to 24.00
Railroad knuckles and couplers...	28.50 to 29.00
Railroad coil and leaf springs...	28.50 to 29.00
Low phosphorus standard bloom and billet ends.....	32.50 to 33.00
Low phosphorus, plates and other grades	\$29.00 to \$29.50
Railroad malleable	26.00 to 26.50
Locomotive axles, steel.....	36.00 to 37.00
Steel car axles	29.50 to 30.00
Cast iron wheels	27.50 to 28.00
Rolled steel wheels.....	28.50 to 29.00
Machine shop turnings	20.50 to 21.00
Heavy steel axle turnings.....	22.50 to 23.00
Short shoveling turnings.....	21.50 to 22.00
Cast iron borings	22.00 to 22.50
Heavy breakable cast	25.00 to 25.50
Stove plate	21.00 to 21.50
Sheet bar crop ends	29.00 to 30.00
No. 1 railroad wrought	21.00 to 21.50

Furnace and Mill Activities in the Youngstown District

YOUNGSTOWN, April 17.—Two merchant blast furnaces were scheduled for resumption this week in the Shenango Valley, one of the Stewart Furnace Co. and the other of the Reliance Coke & Furnace Co. The McKeefrey stack at Leetonia, 20 miles south of Youngstown, will be making iron before the end of the month, states President W. D. McKeefrey. These additions bring the total number of active stacks in the Youngstown district to 42, of 46.

Labor shortage is holding down production of Valley mills to some extent. The A. M. Byers Co., Pittsburgh, continues to operate but 70 of 88 puddling furnaces at its Girard works. The Liberty tin plate plant at Leavittsburg of the Trumbull Steel Co. is inactive.

The Republic Iron & Steel Co. has one inactive jobbing mill at its Niles sheet plant, and arrangements for bringing in its Atlantic blast furnace at New Castle, Pa., are as yet indefinite. The Youngstown Sheet & Tube Co. has an idle tube mill and is operating its puddle furnace department below capacity. One of the eight sheet mills of the Mahoning Valley Steel Co. at Niles is idle this week.

Chicago

Strong Pressure for Deliveries—Consumption of Steel Exceeds Production

CHICAGO, April 17.—The outstanding feature of the market is heavy consumption. All manufacturing interests served by the mills are operating as full as the supply of labor and materials will permit. The pressure of the mills for deliveries is insistent from all quarters and particularly heavy from shafting and rivet makers, concrete bar dealers and implement manufacturers. Some consumers, like the farm machinery makers, are severely handicapped because they cannot obtain enough material to keep their labor continuously employed. Although steel production is now at a high rate, mills are unable to satisfy the wants of customers and are forced to allot their output among them. There has been a notable absence of speculative buying and, so far as can be determined, material is being fabricated into finished products as rapidly as it is received.

In brief, it may be safely said that steel consumption is being checked by insufficient production, heavy as it is. This situation accounts for the decline in buying activity. Customers see no purpose in placing additional orders when they are not getting all the material now on mill books. Likewise building projects are being postponed because of the scarcity of steel and the heavy forward commitments of fabricators. The price situation remains substantially unchanged. Buyers are disinclined to pay high premiums for such small amounts of steel as are available for prompt shipment and most of the mills likewise do not care to encourage a runaway market. Caution is being exercised on all sides. Local mill operations are unchanged.

Pig Iron.—The local market is dull, but prices remain firm in view of the absence of any pressure to sell. Furnaces are not concerned about the present pause in buying, but on the contrary regard all conditions surrounding the current situation as favorable. Shipments by the leading Northern merchant in March were very heavy, and April is expected to break all records. In general, the stocks in melters' yards are not heavy and iron is being consumed practically as fast as it is received. It is therefore regarded as only a question of time when buying is resumed on a broad scale. It is thought significant that some important buyers have already covered for part or all of their third quarter requirements. While there is no doubt that a certain degree of caution among melters has been engendered by the weakness in the Connellsville coke market, it is felt by the trade that this hesitant attitude is unwarranted. It is pointed out that furnaces which buy their coke in the open market covered their second quarter needs at higher than the current levels. Present prices represent what can be done for spot shipment, but coke producers are slow to commit themselves for forward delivery at those levels. Local iron remains unchanged at \$32, base furnace, for forward shipment and \$32.50 to \$33 for early or spot deliveries. Southern foundry is still offered at \$27, base, Birmingham, although at least two stacks are holding for \$1 more. The Southern furnace which sold barge and rail iron in this territory earlier in the year has reentered the market with a limited tonnage for third quarter and will probably again give buyers the benefit of the lower combination freight. Improved shipments of iron from the South and other outside producing centers probably account, in part, for a falling off in demand for spot lots. Practically all of the recent buying activity has been confined to Michigan. We note a sale of 200 tons of high silicon foundry for second quarter and a number of other small tonnages for Michigan delivery. An automobile manufacturer in eastern Michigan has placed 2500 tons of malleable and 2000 tons of foundry for early shipment at a reported price of \$29.50, base, Buffalo furnace, or \$34.04, delivered. A local melter is in the market for 300 tons of low phosphorus and an equal amount of Bessemer.

Otherwise there is no particular activity in low phosphorus and silvery likewise is quiet. Heavy snowstorms north of here have blockaded shipments from charcoal furnaces with the result that cars on track here are bringing premiums.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	\$36.65
Northern coke, No. 1 sil. 2.25 to 2.75	\$33.00 to 34.00
Northern coke foundry No. 2, sil. 1.75 to 2.25	32.00 to 33.00
Malleable, not over 2.25 sil.	32.00 to 33.00
Basic	32.00 to 33.00
High phosphorus	32.00 to 33.00
Southern No. 2	33.01
Low phos., sil. 1 to 2 per cent. copper free	36.00 to 37.00
Silvery, sil. 8 per cent.	44.29

Ferroalloys.—There has been a revival of interest in ferromanganese and two sales for early shipment involve several hundred tons. Prices for early delivery are \$120, seaboard, or higher, while for third quarter shipment the best price available is \$120. Spiegeleisen is difficult to obtain, with prices nominally \$45, Eastern furnace. Fifty per cent ferrosilicon is inactive.

We quote 80 per cent ferromanganese, \$127.56 to \$132.56, delivered; 50 per cent ferrosilicon, \$95, delivered; spiegeleisen, 18 to 22 per cent, \$53.58, delivered.

Structural Material.—New building activity is restricted by the heavily booked condition of fabricators and the scarcity of plain material. Both lettings and inquiries are fewer than was the case a few weeks ago and considerable projected work is being held back because of the remote deliveries now available. Prices show little change and with a few exceptions, mills show little inclination to encourage further advances.

The mill quotation on plain material is 2.50c., Chicago, for indefinite delivery. We quote 2.84c. to 3.19c. delivered Chicago for plain material for specific shipment. Jobbers quote 3.30c. for plain material out of warehouse.

Rails and Track Supplies.—New rail business throughout the country totals 250,000 tons, of which some tonnage has already been booked by the Gary, Tennessee and Carnegie mills. In practically all cases, deliveries are desired as soon as possible, but so far as local producers are concerned, the best shipment available appears to be late in the year. Heavy orders for track fastenings have been placed. Local mills have booked 30,000 kegs of spikes and bolts, 5000 tons of angle bars and 1200 tons of tie plates.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled steel, 2.25c., f.o.b. makers' mills. Standard railroad spikes, 3.25c. mill; track bolts with square nuts, 4.25c. mill; iron tie plates, 2.85c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.80c. base and track bolts, 4.80c. base.

Bolts and Nuts.—Western sellers continue to adhere to the discounts of March 1. Spot business is fairly active, but specifications against second quarter contracts are not yet heavy. Some makers are no longer actively soliciting business because of heavy commitments and operations restricted by slow deliveries of raw materials.

Jobbers quote structural rivets, 4c.; boiler rivets, 4.10c.; machine bolts up to 3/4 x 4 in., 45 and 5 per cent off; larger sizes, 45 and 5 off; carriage bolts up to 3/4 x 6 in., 40 and 5 off; larger sizes, 40 and 5 off; hot pressed nuts, squares and hexagons, tapped, \$2.50 off; blank nuts, \$2.50 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off.

Bars.—All classes of consuming manufacturers are operating as full as the supply of steel and labor will permit. Rivet and shafting makers, implement manufacturers and concrete bar dealers are exerting heavy pressure for deliveries, in fact far beyond the capacity of mills. The situation is particularly tense with some of the farm machinery plants which are in dire need of material in order to hold the available supply of labor. Soft steel bars remain on approximately the same price basis, although prompt material is difficult to obtain.

from any source. Demand for bar iron is of liberal proportions with most business going at 2.60c., mill, although one producer is holding for 2.75c. Buying of rail steel bars continues at a good rate and prices range from 2.30c. to 2.40c., mill.

Mill prices are: Mild steel bars, 2.40c., Chicago, for indefinite delivery and 2.84c. to 3.19c. for specific delivery; common bar iron, 2.60c. to 2.75c., Chicago; rail steel, 2.30c. to 2.40c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 4.30c. for rounds and 4.80c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 3c. base; hoops, 4.55c.; bands, 3.95c.

Wire Products.—With the arrival of spring weather, labor has shown a tendency to lay off with the result that production is not quite up to recent levels. Pressure for deliveries is unrelaxed, but new business is not so heavy. In general, mills are discouraging new orders from those who still have considerable tonnage on their books. From all reports the consumption of nails is undiminished. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 1142.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, \$3.75 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, \$3.80 per 100 lb.; cement coated nails, \$3.25 per keg.

Plates.—Buying has fallen off somewhat, chiefly because consumers are not getting all the steel which they now have on mill books. With insistent pressure for deliveries from all quarters, producers find it impossible to satisfy the wants of consumers. This situation has had the effect of checking industrial activity. New purchases of cars, for instance, have declined, not because of increased costs, but because of extended deliveries. The carriers would buy more equipment if they could get it in time for their heavy fall traffic. Purchases of oil storage tanks, stills, etc., have also declined. The price situation in plates is substantially unchanged.

The mill quotation is 2.50c., Chicago, for indefinite delivery and 2.84c. to 3.19c. delivered Chicago for specific shipment. Jobbers quote 3.30c. for plates out of stock.

Cast Iron Pipe.—New business is developing in good volume and while base prices remain unchanged, premiums of \$2 to \$3 a ton are being obtained for 4- and 6-in. because of the scarcity of those sizes. Akron, Ohio, has awarded 1200 tons of 6- to 20-in. to the United States Cast Iron Pipe & Foundry Co., and will take bids April 28 on 1260 tons of 36-in. Jackson, Mich., receives tenders on 730 tons of 6-, 8- and 12-in. April 25. Other pending business includes:

Manitowoc, Wis., 5000 ft. of 6-in. and 2000 ft. of 8-in. class C.

Oconomowoc, Wis., 3800 ft. of 6-in., 1100 ft. of 4-in. and 700 ft. of 8-in., Class C, April 30.

Altamont, Ill., 265 tons of 4-in. and 92 tons of 6-in. Class B, April 23.

Port Atkinson, Wis., 8000 ft. of 4-in. and 6-in. gas, April 18.

Springfield, Ill., a substantial tonnage of 12- 16- and 20-in. class A for a filtration plant, April 23.

A private inquiry from Cincinnati calls for 2300 tons.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$61.20 to \$62.20; 6-in. and above, \$57.20 to \$58.20; class A and gas pipe, \$5 extra.

Reinforcing Bars.—Lettings of the week are few, but this is accounted for, in part at least, by the growing scarcity of steel. Deliveries from the mills are growing worse rather than better. In fact, one important concrete bar dealer has not yet received shipments against his first quarter contracts. Sellers therefore cannot commit themselves to the extent of the tonnage which they have contracted for, but must restrict their obligations to a steel which they can reasonably expect to be shipped under present conditions. Local warehouse prices for deformed steel bars remain unchanged at 3c. Lettings include:

American Exchange Bank Building, Milwaukee, Wis., 150 tons to Concrete Steel Co.

Elgin, Joliet & Eastern roundhouse, Gary, Ind., 110 tons to Concrete Steel Co.

Milwaukee-Waukesha Delivery Co., Milwaukee, Wis.,

storage warehouse and garage, 100 tons to Kalman Steel Co. Missouri, Kansas & Texas, improvements, Waco, Tex., 350 tons to Laclede Steel Co.

Pending work includes:

Sewage treatment plant, Urbana, Ill., 355 tons.

Alvernia High School for St. Francis Sisters, Chicago, 300 tons.

St. Luke's Hospital, Duluth, Minn., 350 tons.

Bachelor Hotel and Amusement Building for Second Street Co., Milwaukee, 350 tons to Corrugated Bar Co.

Engineering Building, 137 Second Street, Milwaukee, 200 tons to Concrete Engineering Co.

Sheets.—Large buyers are still able to place business for reasonably early delivery at 3c. base, Pittsburgh, for blue annealed, 4c. for black and 5c. for galvanized, although considerably higher prices are being paid in some instances. Demand is not so pressing as some weeks ago and it would appear that users have covered for their principal needs. Local mills remain out of the market.

Mill quotations are 4c. for No. 28 black, 3c. to 3.50c. for No. 10 blue annealed and 5c. to 5.50c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4.15c. for blue annealed, 5c. for black and 6.10c. for galvanized.

Old Material.—Further price declines and light consumptive buying characterize the market. Iron mills have placed some tonnage within the past week, but other consumers have shown little interest in the market and profess to be well covered. At the same time, steel mills are rejecting increasing quantities of material. All of these factors have had the effect of stimulating the unloading of yard accumulations. Cars are being delivered to local dealers faster than they can unload them. The supply of scrap has suddenly become more than ample to supply current demand. Railroad lists also are liberal. A local dealer bought 50 cars of mixed scrap from the Pennsylvania, Northwestern Region, the road having insufficient labor to sort it. The Rock Island offers 5000 tons; the Chesapeake & Ohio, 4000 tons; the Northern Pacific, 3000 tons; the Illinois Central, 1800 tons, and the St. Paul, 1700 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	\$26.00 to \$26.50
Cast iron car wheels	27.50 to 28.00
Relaying rails, 56 and 60 lb.	28.50 to 29.50
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Rolled or forged steel car wheels	28.00 to 28.50
Rails for rolling	23.50 to 24.00
Steel rails, less than 3 ft.	25.50 to 26.00
Heavy melting steel	22.00 to 22.50
Frogs, switches and guards cut apart	22.00 to 22.50
Shoveling steel	21.75 to 22.25
Drop forge flashings	18.50 to 19.00
Hydraulic compressed sheets	19.50 to 20.00
Axle turnings	19.50 to 20.00

Per Net Ton	
Iron angle and splice bars	25.50 to 26.00
Steel angle bars	22.00 to 22.50
Iron arch bars and transoms	25.50 to 26.00
Iron car axles	30.00 to 30.50
Steel car axles	24.50 to 25.00
No. 1 busheling	19.00 to 19.50
No. 2 busheling	14.00 to 14.50
Cut forge	19.50 to 20.00
Pipes and flues	15.50 to 16.00
No. 1 railroad wrought	20.00 to 20.50
No. 2 railroad wrought	19.50 to 20.00
Steel knuckles and couplers	24.50 to 25.00
Coil springs	26.00 to 26.50
No. 1 machinery cast	25.50 to 26.00
No. 1 railroad cast	24.00 to 24.50
No. 1 agricultural cast	23.50 to 24.00
Low phos. punchings	22.00 to 22.50
Locomotive tires, smooth	23.00 to 23.50
Machine shop turnings	14.00 to 14.50
Cast borings	16.00 to 16.50
Short shoveling turnings	16.00 to 16.50
Stove plate	21.00 to 21.50
Grate bars	20.50 to 21.00
Brake shoes	21.50 to 22.00
Railroad malleable	25.00 to 25.50
Agricultural malleable	24.00 to 24.50

The House of Representatives of the Iowa Legislature April 16 passed a bill appropriating \$10,000 for the campaign against the Pittsburgh basing point practice. The bill had previously been passed by the State Senate on April 7. The Minnesota Legislature appropriated an equal amount for the same purpose April 3.

New York

Exports of Coal and Coke Delayed—Pig Iron Dull—Buffalo the Low Point

NEW YORK, April 17.—Shipments of coal and coke to foreign ports continue to be retarded by the embargoes at Philadelphia and other ports. The market is weak and furnace coke can now be had at \$6.25, Connellsville ovens, while foundry coke is quoted at \$7.50 to \$7.75, and some off-grade cokes are going at very low prices.

Iron Ore.—Sellers of Eastern ores are meeting very keen competition from foreign ores and while some sales of Eastern ores have been made, prices have not been definitely established. Lake Superior producers do not expect to sell in the Eastern market except perhaps an occasional tonnage which a furnace may need for its mixture.

Pig Iron.—Dullness is even more pronounced than for the preceding two weeks and prices are showing an unsteady tendency. Opinions in the trade differ as to whether there is any real weakness, but lower quotations have developed at Buffalo, where \$29.50, base, is now quoted freely even for prompt delivery and probably lower could be done. In fact, there seems little doubt that \$29 could be done for third quarter delivery on Buffalo iron. The only purchase of large size during the past week was about 3000 tons by the Worthington Pump & Machinery Corporation for delivery at various plants. A sale of 400 tons of Virginia iron was made on a basis of \$29 for No. 2 plain. Reports of sales for export to England are not credited.

We quote delivered in the New York district as follows, having added to furnace prices \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	\$34.27 to \$35.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	33.27 to 34.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	32.27 to 33.27
Buffalo, sil. 1.75 to 2.25	34.41 to 34.91
No. 2X Virginia, sil. 2.25 to 2.75	34.94
No. 2 Virginia, sil. 1.75 to 2.25	34.44

Ferroalloys.—Two advances by British producers of British ferromanganese have been announced in the last week. For shipment during the last half, the only positions available, the quotation was advanced last Thursday, April 12, from \$115 to \$117.50, seaboard, and again yesterday to \$120, seaboard. Previous to the last advance about 500 to 1000 tons was sold, but no sales are yet reported at the price established yesterday. These advances are ascribed to high fuel and ore prices in England. Demand is not active as most consumers are fairly well covered as far ahead as they can measure their needs. The price of \$120 is understood to have been the price of the domestic producers for some little time in such cases where they have been willing to sell. The spiegeleisen market is also quiet, with the higher grade quoted nominal at \$40, furnace, for the domestic product. Only a little of the imported alloy is available and as high as \$50 or more, seaboard, has been obtained for this. The minimum price of 50 per cent ferrosilicon appears to be \$95, delivered, although it is stated that it might be possible to shade this down to \$92.50 in certain circumstances.

Cast-Iron Pipe.—Private and municipal buying is active. Prices are firm with no early prospect of a decline, considering the general price situation and probability of increased difficulties in obtaining common labor as summer approaches. The railroad embargoes are still proving a great hindrance to shipments. Although Southern makers have advanced the extra for Class A and gas pipe to \$5 per ton, the differential in this district continues unchanged at \$4 per ton. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$58.50; 4-in. and 5-in., \$63; 3-in., \$68.80, with \$4 additional for Class A and gas pipe. Soil pipe is slightly less active than in previous weeks, as jobbers are rather well covered and are awaiting price developments before making further commitments. We quote discounts of both Southern

and Northern makers, delivered New York, as follows: 2-in. to 6-in. standard, 13 to 15% per cent off list; heavy, 23 to 25% per cent off list.

Warehouse Business.—Buying from stock, as yet, shows no sign of a decline, the recent increases on most products in warehouses evidently having had no appreciable effect on business. Both structural steel and plates are active, some consumers with orders at mills being forced into the warehouse market to satisfy immediate requirements. In some instances, difficulty is encountered in obtaining sufficient supply of some material. The market on black and galvanized sheets, which has been quiet for the past few weeks, seems to have been stirred into renewed activity following the recent advance in prices made by most warehouses. Mill deliveries are reported as delayed and stocks on hand are generally not large. Spring steel is stiffening as a result of higher mill quotations and warehouses report various advances in price. One dealer, somewhat of a factor in this district in spring steel, has advanced prices to a basis of 5c. per lb. and another warehouse is quoting on a base of 4.70c. per lb. Warehouses handling wrought iron and steel pipe report an active business on steel pipe with deliveries from mills becoming more and more delayed. There has been no change in brass and copper quotations since March. We quote prices on page 1164.

Finished Iron and Steel.—The steel market is lacking in fresh developments, the situation being very much as it has existed in recent weeks. Several of the largest producers are selling in a very limited way and the urgent requirements of consumers are being met by the smaller mills, which in all instances are obtaining premiums for early deliveries. The volume of inquiry has fallen off and likewise the tonnage being booked, but all mills have comfortable backlogs. Most of the Eastern mills are asking 2.75c., Pittsburgh, for plates and one is as high as 2.85c. A large independent producer, however, has not gone above 2.60c., Pittsburgh, and now is naming very good deliveries, six to eight weeks, at this price. The General Petroleum Corporation, New York, is in the market for 1100 tons of plates for Pacific Coast work. Standard structural shapes are quoted from 2.50c. to 2.85c., Pittsburgh, the lower figure being named by one large producer, while the higher figure is that generally asked by smaller Eastern mills. One company continues to quote 3c. at its mill. Bars are not easily obtainable at 2.50c., Pittsburgh, and prices up to 2.75c., Pittsburgh, are being paid for small lots for reasonably prompt delivery. In sheets, tin plate, wire products and steel pipe the situation is tight and producers generally have very little to offer. Most of the structural steel work intended for starting this spring has been placed under contract and there is now somewhat of a lull in the demand, which is not surprising as there is usually a lull at this time of year. Preliminary estimates are being made up on a considerable volume of work, which will probably come into the market definitely at a later date. Car inquiries and orders are not active, the largest business of the week being orders placed by the Virginia Railway for 1500 cars, for which about 25,000 to 30,000 tons of steel will be required. Unusual pressure is being put on the mills by jobbers, who are making every effort to keep up their stocks, which are being heavily drawn upon.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.69c. to 2.84c.; plates and structural shapes, 2.79c. to 2.84c.; bar iron, 2.84c.

Old Material.—New transactions are limited and the market generally is quiet with a slight tendency toward weakness on some grades. Mills seem to have sufficient scrap, as a rule, for present needs, with shipments going forward on old contracts. The price on heavy melting steel of railroad quality delivered to Bethlehem is off another 50c. per ton, dealers now offering \$23.50. As high as \$24 per ton delivered Conshohocken is being paid for No. 1 yard steel and \$23.50 per ton for yard steel delivered to Coatesville and \$23.25 to Harrisburg. Specification pipe is slightly lower with \$20 per ton being paid delivered to Lebanon. As high as \$21.50 per ton delivered Buffalo has been paid on borings

and turnings for a furnace in that district. Stove plate is particularly inactive with consumers at Mahwah, Perth Amboy, N. J., and other nearby points out of the market temporarily, but renewed activity is expected within a week. No. 1 heavy melting steel is quotable this week at \$19.50 to \$20.50 per ton with railroad quality at \$20.50 to \$21 per ton.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard.....	\$19.50 to \$20.50
Steel rails, short lengths, or equivalent	20.50 to 21.00
Rails for rolling.....	22.00 to 23.00
Relaying rails, nominal.....	29.00 to 30.00
Steel car axles.....	25.00 to 26.00
Iron car axles.....	29.00 to 30.00
No. 1 railroad wrought.....	22.00 to 23.00
Wrought iron track.....	22.00 to 22.50
Forge fire.....	15.50 to 16.00
No. 1 yard wrought, long.....	19.50 to 20.00
Cast borings (clean).....	16.00 to 16.50
Machine-shop turnings.....	15.50 to 16.50
Mixed borings and turnings.....	14.50 to 15.00
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	15.75 to 16.25
Stove plate	18.50 to 19.00
Locomotive grate bars.....	20.00 to 20.50
Malleable cast (railroad).....	22.00 to 23.00
Cast-iron car wheels.....	22.00 to 23.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$26.00 to \$26.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	25.00 to 25.50
No. 1 heavy cast, not cupola size	23.00 to 23.50
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00

Boston

Pig Iron Sales Drop, but Prices Appear to Hold Well

BOSTON, April 17.—Sales of pig iron dropped to small proportions the past week, because of the activity of brokers in the coke market and the tendency of melters to hold off from third quarter contracts pending possible price concessions and business developments. In the absence of prospective business, those Pennsylvania furnaces, which a week ago, shaded \$1 differentials, seem less inclined to do so. Alabama furnaces are pegged at \$27 on cars, shipping point, and a majority of the Virginia furnaces doing business in this territory quote \$29 base for second and \$29.50 for third quarter. Buyers claim one Virginia furnace wanting a backlog has made concessions, but as far as can be ascertained no actual sales have been made except at the prices specified above. Buffalo furnaces, taking the bulk of the past week's business for third quarter, are holding prices. The Worthington Pump & Machinery Corporation has closed on 2390 tons, silicons ranging from 1.75 up to 4 plus, through New York, about 900 tons being for New England plants. Included in the past week's sales is 150 tons Buffalo malleable, a cleanup of a lot, at \$30 base. Feelers for third quarter irons are fairly numerous, but the actual tonnage required is uncertain.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75.....	\$35.15 to \$36.15
East. Penn., sil. 1.75 to 2.25.....	34.65 to 35.65
Buffalo, sil. 2.25 to 2.75.....	34.91 to 36.41
Buffalo, sil. 1.75 to 2.25.....	34.41 to 35.91
Virginia, sil. 2.25 to 2.75.....	34.92 to 35.92
Virginia, sil. 1.75 to 2.25.....	34.42 to 35.42
Alabama, sil. 2.25 to 2.75.....	37.10
Alabama, sil. 1.75 to 2.25.....	36.60

Iron Importations.—Receipts of foreign iron at this port continue, but on a much smaller scale than heretofore. Importations for the week ending April 14 amounted to but 600 tons of Scotch, whereas for the previous week they were 260 tons of English and 1626 tons of Belgium, a total of 1886 tons. Receipts for the first half of April aggregated 2486 tons, while for the corresponding period in March they were 4839 tons.

Coke.—New England by-product foundry coke makers opened their books the past week for last half contracts on a basis of price ruling date of shipment. The books of the Providence Gas Co. remained open 36 hours only. The company reduced its contract obliga-

tions approximately 30 per cent for the period, by a concentration of the territory it will serve. This policy was necessary, due to certain developments contemplated at its plant. The New England Coal & Coke Co. opening its books at the same time as the Providence company, continues to take business. Contracts accepted to date indicate an increase in foundry requirements during the last half of 1923. On old contracts freer shipments are noted because of a better car supply situation. Lower Connellsville coke prices so far have failed to bring out any appreciable increase for such fuel, presumably because of the still uncertain transportation situation. For current foundry needs, the New England Coal & Coke Co. asks \$16 and the Providence Gas Co. \$15 delivered within the \$3.10 freight zone.

Old Material.—New England foundries continue to take car lots and round tonnages of No. 1 machinery cast in charging sizes at an extreme range of about \$28 to \$29 delivered, with \$28 to \$28.50 the average delivered price. No. 1 heavy cast, to be broken, has sold at \$26 to \$27 delivered and a small tonnage of mixed No. 1 and No. 2 at \$26. Straight No. 2 cast is a drug on the market, however, and quotations therefore are purely nominal. A small tonnage of car wheels sold the past week at \$27.90 delivered New England. Pennsylvania and other mills have not re-entered this market for old material, but dealers have continued to buy against old contracts. Early in the week, machine shop turnings were taken at \$16.50 on cars, yet the market today is 50c. lower. Chemical borings, forged scrap and bundled skeleton have depreciated as much. Quotations on blast furnace borings, shafting, axles and rails for rerolling are further adjusted without enough business really passing to constitute a market. Practically all heavy melting steel bought recently applies to old contracts for eastern Pennsylvania delivery.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$28.00 to \$28.50
No. 2 machinery cast.....	26.00 to 26.50
Stove plate	21.00 to 21.50
Railroad malleable	27.00 to 28.00
Street car wheels.....	26.00 to 26.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$19.00 to \$20.00
No. 1 railroad wrought.....	21.00 to 21.50
No. 1 yard wrought.....	19.00 to 19.50
Wrought pipe (1 in. in diam., over 2 ft. long)	15.50 to 16.00
Machine shop turnings.....	15.50 to 16.00
Cast iron borings, rolling mill.....	15.50 to 16.00
Cast iron borings, chemical.....	19.00 to 19.50
Blast furnace borings and turnings	15.50 to 16.00
Forged scrap and bundled skeleton	15.00 to 15.50
Shafting	22.00 to 23.00
Street car axles	22.00 to 23.00
Rails for rerolling.....	20.50 to 21.00

Detroit Scrap Market

DETROIT, April 16.—There is no sign of a let-up in the melting schedule in this district and prices on all grades of old material are practically the same as those quoted a week ago. There is some evidence of automotive castings being stocked, but this is a normal situation, as the past several months have been ones where the manufacturer was receiving only enough for current needs.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel.....	\$23.00 to \$24.50
Shoveling steel	23.50 to 24.50
No. 1 machinery cast.....	27.00 to 28.50
Cast borings	28.00 to 28.50
Automobile cast scrap.....	29.00 to 32.00
Stove plate	20.00 to 22.00
Hydraulic compressed	20.25 to 21.25
Turnings	17.00 to 18.00
Flashings	18.25 to 19.25

Excavation has been started on the powerhouse for the Pere Marquette shops at Wyoming, Mich., near Grand Rapids. The cost is estimated at \$1,000,000 and the contract for 2500 tons of steel has been awarded to the Whitehead & Kales Co. of Detroit.

Cincinnati

Decided Dullness in Pig Iron and Coke—Scrap Active with Some Grades Lower

CINCINNATI, April 17.—Dullness continued in the market last week and today. Only one inquiry of importance is being figured. There were only two sales of consequence reported in the Cincinnati territory last week, one being 1000 tons of foundry to a machine tool manufacturer, and one of 1100 tons of various grades to a pump manufacturer. The first sale was made on a basis of about \$32.50, furnace, which would figure back to \$30.50, Ironton. Prices on the other sale were not disclosed, but it is intimated that better than \$31, Ironton base, was done. Some iron was sold to northern Indiana and southern Michigan points for shipment from southern Ohio, but the aggregate tonnage was light. Southern iron is very quiet, only a few carload lots being discharged of and prices are unchanged from last week. There was no activity in silveries or basic. Inquiries include 1600 tons from the Link Belt Co., 600 from a stove maker near Cincinnati, and 1200 tons from the Norfolk and Western Railway Co., on which no action has yet been taken.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)....	\$31.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft) ..	31.55
Ohio silvery, 8 per cent.	41.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2) ..	33.27
Basic Northern	32.27
Malleable	33.27

Finished Materials.—There appears to be no let-up in the demand for finished materials, and mills are still accepting only the most desirable business offering, with deliveries at mills' convenience. Definite promises are hard to obtain, but 90 days appears to be the minimum at which delivery may be expected. Prices generally rule about the same as last week, ranging from 2.35c. to 2.75c. on bars, with 2.50c. to 2.60c. being the more general quotations. On shapes and plates 2.75c. is being done for reasonably early delivery, with 2.60c. the independent market for indefinite delivery. The demand for sheets is still very insistent, and premiums are still being paid on early shipments. The regular market is now quoted at 3.25c. for blue annealed, 4c. for black, 5.25c. to 5.50c. for galvanized, although it is reported that some orders were booked by one or two mills for galvanized sheets at 5c. Tin plate continues to be quoted at \$6 per base box. There is a very heavy demand for wire products, and more particularly wire nails, and further price advances are expected. Most mills are taking business for 90-day deliveries. An inquiry is current for 2200 tons of 65-lb. rails from a Memphis jobber, but in light rails there is practically no activity. Track fastenings are in fair demand.

Structural Activity.—While the number of new projects coming up is not very large, indications are that during the summer months there will be much more activity, as a number of contemplated buildings will likely go ahead. The only letting of importance during the week was an office building at Columbus, Ohio, 800 tons, to the Fort Pitt Bridge Co. A hotel at Portsmouth, Ohio, on which bids are being taken, will require about 100 tons.

Reinforcing Bars.—The demand for reinforcing bars continues brisk for buildings and road work, and a number of new projects are now being figured. These include a store building for Goldstein & Moseson, Louisville, 100 tons; addition to Odd Fellows Home, Springfield, Ohio, 100 tons, bids on which will be received till May 10; the McCrory store building, Springfield, 150 tons; garage and sales building for the Bauer Auto Sales Co., Cincinnati, 100 tons; the Wittenberg College stadium, Springfield, 200 tons; an apartment building at Dayton, Ohio, 500 tons, and a manufacturing plant for the Esterline-Angus Co., Indianapolis, 150 tons.

Tool Steel.—Continued improvement is noted in the demand for tool steels, with prices very strong. Eighteen per cent tungsten high speed steel is quoted at 75c. to 95c. per lb.

Warehouse Business.—Local jobbers are doing a

very good business, with prices very firm. Reinforcing bars and small angles are in heavy demand, with much improvement also being shown in cold-rolled products. Sheets also are moving in large quantities, inability of mills to make early deliveries redounding to the advantage of jobbers, who are shipping their products to all sections of the country.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.25c.; cold-rolled flats, squares and hexagons, 4.75c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, 5c.; No. 28 galvanized sheets, 6c.; No. 9 annealed wire, \$3.30 to \$3.40 per 100 lb.; common wire nails, \$3.40 per keg base.

Coke.—Quiet also reigns in the coke market. Prices are softer and Connellsville furnace coke was available for prompt shipment today at \$6. Foundry grades were offered at \$8. Wise County prices are \$7.50 for furnace, and \$8.50 for foundry. New River operators are still out of the market, the last sales being made at \$13. Some domestic contracts are still being made at sliding scale prices.

Old Material.—The scrap market was active last week. A steel plant in this district closed for 10,000 tons of heavy melting steel at \$26, delivered, and some small lot sales of borings and turnings were made at \$19 and \$18 respectively. Prices on most grades are lower, particularly on the steel mill grades, but the general opinion seems to be that the decline will be halted shortly as mills enter the market. The N. & W. closed a list last week on which good prices were secured. The Southern list also brought better prices than the previous one.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton
Bundled sheets	\$17.50 to \$18.00
Iron rails	19.50 to 20.00
Relaying rails, 50 lb. and up....	29.50 to 30.00
Rails for rolling	21.50 to 22.00
Heavy melting steel	21.50 to 22.00
Steel rails for melting.....	20.50 to 21.00
Car wheels	22.50 to 23.00
	Per Net Ton
No. 1 railroad wrought.....	18.50 to 19.00
Cast borings	15.50 to 16.00
Steel turnings	14.50 to 15.00
Railroad cast	22.00 to 22.50
No. 1 machinery cast.....	24.50 to 25.00
Burnt scrap	17.00 to 17.50
Iron axles	28.50 to 29.00
Locomotive tires (smooth inside) ..	20.00 to 20.50
Pipes and flues.....	15.50 to 16.00

St. Louis

Pig Iron Purchases in Small Lots—No Speculative Features

ST. LOUIS, April 17.—Interest in pig iron in this market still centers in spot material. Purchases are mostly in small lots for immediate shipment and there is an insistent demand for shipments against contracts. Buying for third quarter is light and there is a marked absence of speculative buying, a condition satisfactory to the makers. The principal inquiry before the market is for 5000 tons of foundry iron for May, June and July delivery for an Indiana melter and a Kansas City melter wants 600 tons of foundry iron for third quarter. The market is strong at \$32, Chicago, for Northern iron and \$27, Birmingham, for Southern make. The St. Louis Coke & Chemical Co., whose price is \$33 to \$34, Granite City, is sold up into the third quarter.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Birmingham (rail and water), \$5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25.....	\$34.16
Northern malleable, sil. 1.75 to 2.25.....	34.16
Basic	34.16
Southern fdy., sil. 1.75 to 2.25.....	32.17

Ferroalloys.—The inquiry for speigleisen mentioned in last week's IRON AGE, could be only partly filled because of the scarcity of material. Ferrosilicon has advanced \$2.50 for last half delivery.

Finished Iron and Steel.—Inquiries for finished iron and steel have fallen off considerably. This is due to the fact that buyers realize the difficulties of getting shipments and are cautious about making purchases on

the present market. The Missouri Pacific Railway is in the market for 100 tons of structural shapes, and several hundred tons of underframes, while the Missouri-Kansas-Texas Railway wants 300 tons of structural plates and shapes.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, cold rolled, one pass, 5c.; cold drawn rounds, shafting and screw stock, 4.45c.; structural rivets, 4.15c.; boiler rivets, 4.25c.; tank rivets, $\frac{1}{4}$ in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, square or hexagon blank, \$2.50; and tapped, \$2.50 off list.

Coke.—The market for coke is active in metallurgical and industrial grades, with Connellsville make easing off. Domestic grades show considerable falling off in demand because of the warmer weather.

Old Material.—The demand for relaying rails features the market for old material. Unable to get rails from steel mills except for deferred shipments, some of the larger lines are looking to dealers in relaying grades. One St. Louis concern has sold more than 40,000 tons in 60 to 80 lb. weights in the last ten days, breaking all volume records. Blast furnace material is in good demand, otherwise the market remains quiet. With consumers quitting buying here, shipments into other markets are heavy. The Wabash Railway has a fair-sized list closing this week.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$22.50 to \$23.00
Rails for rolling	22.00 to 22.50
Steel rails, less than 3 ft.	23.00 to 23.50
Relaying rails, standard section..	37.50 to 39.00
Cast iron car wheels	27.00 to 27.50
Heavy melting steel	21.50 to 22.00
Heavy shoveling steel	21.00 to 21.50
Frogs, switches and guards cut apart	22.50 to 23.00
Per Net Ton	
Heavy axles and tire turnings ..	16.00 to 16.50
Steel angle bars	20.50 to 21.00
Iron car axles	27.50 to 28.50
Steel car axles	24.00 to 24.50
Wrought iron bars and transoms ..	25.75 to 26.25
No. 1 railroad wrought	20.00 to 20.50
No. 2 railroad wrought	19.75 to 20.25
Railroad springs	24.00 to 24.50
Steel couplers and knuckles	24.00 to 24.50
Cast iron borings	14.50 to 15.00
No. 1 busheling	18.00 to 18.50
No. 1 railroad cast	24.00 to 24.50
No. 1 machinery cast	24.50 to 25.00
Railroad malleable	23.50 to 24.00
Machine shop turnings	13.50 to 14.00

Birmingham

Lull in Pig Iron Is Most Pronounced in Four Months—No Weakness

BIRMINGHAM, ALA., April 16.—No large sales of pig iron were reported in the Birmingham iron market last week. The usual business was from a carload to 100 and 200 tons for prompt shipment. Inquiry was not much in evidence. All transactions were at \$27 except for special irons. Makers seem determined to play a safe game. Shipments are very good. They amounted to about 265,000 tons in March, including 1019 tons for Los Angeles, 50 tons for Oakland and 45 tons for Portland, winding up Pacific Coast orders on the books of Birmingham makers. The lull in the iron market is the most pronounced in four months, but seems to satisfy both maker and consumer. The leading interest operates but two stacks on foundry and is out of the game, operations being on business booked several weeks ago. Stocks, which almost made a new low record, will do that this month according to indications.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	\$27.00
Basic	26.00
Charcoal, warm blast	34.00

Cast-Iron Pipe.—Pressure pipe orders rolled in to get ahead of the advance effective April 9. More than 10,000 tons of pressure and sanitary pipe moved to the Pacific Coast last week, cities taking it being Los Angeles, Oakland, Tacoma, San Francisco and Seattle.

Los Angeles cargoes embraced nearly 3000 tons. Pressure base is \$49. Sanitary pipe base remains at \$75 for standard with all plants fully booked.

Finishing Mills.—The same strain at 100 per cent production marks all steel mills. The Pacific Coast took 1100 tons of wire, nails, staples and hoop iron via Mobile last week. Cuban points took several lots of wire mill products and hoop iron. The Tennessee company will make first melt of steel in its modern and new steel foundry at Fairfield this week. It will go on steel castings for the car works. Bar iron is \$2.70, f.o.b. Birmingham. Wire mills receive more new business than they produce.

Coal and Coke.—Europe continues to take pitch by cargoes of 4000 and 5000 tons for brickettes. Foundry coke is at \$9 and \$10 for spot deliveries. All ovens are in blast, but demand is ahead of supply.

Old Material.—Scrap is active and large quantities are changing hands. The yard men report it difficult to maintain supplies. Some prices are up \$1.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Old steel rails	\$18.00 to \$20.00
No. 1 steel	16.00 to 18.00
No. 1 cast	24.00 to 25.00
Car wheels	24.00 to 25.00
Tramcar wheels	23.00 to 24.00
Stove plate	18.00 to 19.00
Cast iron borings	12.00 to 13.00
Machine shop turnings	12.00 to 13.00

Buffalo

Pig Iron Now Obtainable for Second Quarter at Same Price as for Third

BUFFALO, April 17.—The falling off in demand has affected prices to a slight extent and second quarter foundry iron can be bought on the same basis as third quarter. Up to a few days ago furnaces able to consider second quarter tonnages were asking 50c. more for second quarter and premiums of \$1 for prompt shipment. Other than this development, the situation is unchanged. Foundries are melting big tonnages and there is no immediate slackening in foundry activity in sight. Sellers believe there is considerable third quarter tonnage to be placed and that as soon as demand revives the \$30 base price will be passed. Malleable is strong at \$30. Notwithstanding the slump in demand, one producer reports a lively week and that upward of 12,000 tons was inquired for, and about one-third of the business developed into actual sales. Very little of the inquiry now engaging sellers is for prompt shipment. Most of it is for third quarter and almost no interest in fourth quarter has appeared.

We quote f.o.b. per gross ton Buffalo as follows, the higher price being for shipment this month:

No. 1 foundry, 2.75 to 3.25 sil.	\$30.50
No. 2X foundry, 2.25 to 2.75 sil.	30.00
No. 2 plain, 1.75 to 2.25 sil.	29.50
Basic	30.00
Malleable	30.00
Lake Superior charcoal	37.28

Finished Iron and Steel.—Limited tonnages in bars, shapes and plates are being taken for third quarter delivery by a leading mill. No price schedule for this period has been given out. A few agencies are finding a slowing up in demand from local buyers, although pressure outside the district is just as strong. The lowest bar price is 2.35c.; shapes and plates at 2.45c. Demand for cold finished material is quieter. Agencies which have been out of the market for some time are finding fewer inquiries, but attribute this to the fact that their customers know they are unable to take business. A Canadian buyer is inquiring for 800 tons of pipe in one size.

We quote warehouse prices, Buffalo, as follows:

Structural shapes, 3.50c.; plate, 2.50c.; soft steel bars, 3.40c.; hoops, 4.50c.; bands, 4.20c.; blue annealed sheets, No. 10 gage, 4.20c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5.10c.; cold rolled round shafting, 4.25c.	
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Coke.—Consumers interested in stocking up are making a fairly interesting demand. Good foundry grades are selling for \$8.50, f.o.b. ovens, with a \$3.28 freight rate to Buffalo.

Old Material.—Prices remain firm, although demand has fallen off. There is some trading between dealers, and mills generally are more interested in cleaning up old contracts than in making new ones. New sales have been extremely light.

Heavy melting steel.....	\$24.50 to \$25.00
Low phos., 0.04 and under.....	28.00 to 29.00
No. 1 railroad wrought.....	22.00 to 23.00
Car wheels.....	26.00 to 27.00
Machine shop turnings.....	18.00 to 19.00
Cast iron borings.....	19.00 to 20.00
No. 1 bushing.....	22.50 to 23.00
Heavy steel turnings.....	23.00 to 23.50
Stove plate.....	23.00 to 24.00
Grate bars.....	23.00 to 24.00
Bundled sheet stampings.....	18.00 to 19.00
No. 1 machinery cast.....	26.00 to 27.00
Hydraulic compressed.....	22.50 to 23.00
Railroad malleable.....	27.50 to 28.50

Cleveland

Little Buying of Pig Iron—Scrap Dull and Inclined Toward Weakness.

CLEVELAND, April 17.—Independent ore mining companies are waiting action by the Steel Corporation in respect to wage advances for ore miners before giving their own miners an advance. A wage advance by the Oliver Mining Co., operating the Steel Corporation mines, would doubtless be followed by general advances by the independent companies. Long before ore prices were named for this season, independent operators had expected that with the scarcity of labor a wage advance would be necessary this spring. Ore sales during the week were light, but some consumers are figuring on their requirements and are expected to place contracts shortly. For prices, see page 1143.

Pig Iron.—The dullness that recently developed in the market continues. Sales during the week were confined largely to rather small lots, being mostly for the third quarter delivery. One or two inquiries have come out for iron for the fourth quarter. Sales include a 1000-ton lot of foundry iron to a Michigan automobile company. The demand from this industry shows no falling off, although consumers in the motor car field are well covered with contracts. Two consumers who recently purchased 1000 tons of foundry iron for the third quarter have sent out inquiries for additional tonnages for the same delivery, one for 500 tons and the other for 300 tons. Among other inquiries is one from the Link Belt Co., Indianapolis, for 1600 tons of malleable iron for June shipment. Reports from all producers show that pig iron shipments and unfilled orders for March exceeded former records since October, 1920, and sales during March were greater than any previous month since February, 1920. While no marked weakness is in evidence, advances in prices appear to have been checked and some producers are showing less disposition to get above what has been recently the more common quotations. Foundry iron is commonly quoted at \$31 in the Valley district and \$31.50 by Lake furnaces. The local supply of iron is still scarce and some consumers are sending inquiries for prompt shipment of iron to outside furnaces. There is no activity in steel making grades. Silvery is in fair demand for small lots and firm at schedule prices. We note the sale of 2000 tons of Southern charcoal iron for the last half delivery at \$35. Southern foundry iron is very quiet. The Stewart Iron Co., Cleveland, started up its blast furnace at Sharon, Pa., Monday on low phosphorus pig iron.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron includes a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace.....	\$31.00
Northern No. 2 fdy., sil. 1.75 to 2.25.....	\$32.15 to 32.77
Southern fdy., sil. 1.75 to 2.25.....	33.00
Malleable.....	32.15 to 32.77
Ohio silvery, 8 per cent.....	42.52
Standard low phos., Valley furnace.....	35.00 to 36.00

Semi-finished Steel.—There is considerable inquiry for sheet bars for early shipment, including one for 8000 tons from an Ohio mill that has run short of

steel from its own semi-finishing department, but no supplies appear available. Eastern mills are now quoting forging billets at \$55 to \$60, at mill.

Sheets.—Black sheets can still be purchased at 3.75c., although some mills are quoting 4c. On galvanized sheets, the range is from 5c. to 5.25c. While the 3c. price has not disappeared on blue annealed sheets, 3.25c. is the more common quotation. The demand is fair.

Reinforcing Bars.—Buffalo will receive bids April 24 for a storm water sewer requiring 1800 tons of reinforcing bars. An inquiry is also out for 200 tons for a warehouse for the International Harvester Co., in Cleveland. One mill has advanced rail steel reinforcing bars \$3 a ton to 2.50c.

Alloy Steel.—There has been considerable buying recently by automobile manufacturers and order books are well filled for the next few months. One leading Central Western manufacturer has advanced prices ¼c. per lb., and, while other producers have not joined in this advance, the minimum prices that have prevailed recently have virtually disappeared.

Warehouse Business.—An advance of \$3 a ton has been made on cold-rolled steel by some of the outside jobbing houses, but no advance has been made by local jobbers. Other local warehouses have met the advance on steel bars, plates, structural material and hoops and bands recently announced by the Carnegie Steel Co.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 9 galvanized wire, 3.70c.; No. 9 annealed wire, 3.25c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.90c.; No. 10 blue annealed sheets, 3.80c. to 4.06c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.60c.

Bolts, Nuts and Rivets.—The 10 per cent advance recently announced by bolt and nut makers has not been placed in effect by all Cleveland producers, but those naming the higher prices report that they are having no trouble in getting business at the advance. The volume of orders is heavy, but largely in specifications on contracts. The leading local rivet manufacturer is still adhering to 2.25c. for structural and 2.35c. for boiler rivets. Specifications are heavy.

Finished Material.—Some mills are entering considerable business in steel bars, plates and structural steel for extended future delivery, but are limiting their commitments to the volume of current production in order to avoid increasing the tonnage on their books. Most of this material can not be delivered before October. One producer is making steel bar reservations for the last half subject to prices to be named later, but restricts the customers to the amount of steel they consumed in the corresponding period last year. However, owing to increased plant operations, consumers are asking for considerable more steel than they used a year ago. There is active demand for steel for early shipment, but the supply is very limited and buyers are placing orders with Cleveland-Pittsburgh district warehouses for lots up to 200 tons. Steel bars are selling at 2.50c. for delivery within two months, and for extended delivery 2.45c. has become the more general quotation, although 2.35c. has not disappeared. Plates are selling at 2.75c. for early shipment and some of the smaller mills are restricting their sales so that they will not be tied up with commitments beyond six to eight weeks. Eastern mills which are quoting plates at 2.85c. to 3c., at mill, are finding their prices too high for this market. The Big Four Railroad received bids last week for 1200 tons of tank plates for the second quarter, but there were only two bidders, both naming a 2.45c. price, but making no delivery promises. Later the railroad divided 1000 tons between two mills, one-half going to a Cleveland mill at 2.75c. The Louisville & Nashville Railroad today took bids for 800 tons of plates. The sales of structural material for early shipment are being made at 2.55c. Lake shipyards have sent out an inquiry for steel for three barges for the Pere Marquette Railroad, requiring 7500 tons of steel, but it seems uncertain whether these boats will be placed. On the inquiry from the Ford interests in Detroit for 7000 tons of structural material for a steel plant and other work,

fabricators have made quotations based on both mill and warehouse prices for plain material. New structural inquiry is light. Ohio fabricators are figuring on the Twenty-third Street viaduct, Chicago, requiring 2000 tons.

Coke.—Foundry coke is weak with quotations ranging from \$7.85 to \$8.50 for standard Connellsville makes. A leading Virginia producer during the past few days has closed contracts for Wise County foundry coke at \$9 for the last half, and in some cases the contracts were made for a full year to July 1, 1924, at that price.

Old Material.—The market is very dull and inclined to weakness, prices on most grades having further declined 25c. to 50c. a ton. No buying is reported by Cleveland or Youngstown district mills. There is little trading between dealers as they are well covered on existing orders. A Cleveland blast furnace interest that has been a large consumer of borings and turnings has been compelled to discontinue their use because of the wrecking of its handling equipment, and this has had some effect on the local market. A Cleveland consumer purchased the heavy melting steel and re-rolling rails recently offered by the New York Central Railroad at reported price of \$27.40.

We quote per gross ton f.o.b. Cleveland as follows:

Heavy melting steel.....	\$24.50 to \$24.75
Rails for rolling	27.00 to 27.50
Rails under 3 ft.	27.00 to 27.50
Low phosphorus melting.....	27.00 to 27.50
Cast borings	19.50 to 19.75
Machine shop turnings	19.25 to 19.50
Mixed borings and short turnings	19.25 to 19.50
Compressed sheet steel	23.50 to 23.75
Railroad wrought	22.00 to 22.50
Railroad malleable	28.50 to 29.00
Light bundle sheet stampings...	19.00 to 19.50
Steel axle turnings	22.50 to 23.00
No. 1 cast	29.00 to 30.00
No. 1 busheling	18.75 to 19.00
Drop forge flashings	21.25 to 21.50
Railroad grate bars	23.00 to 24.00
Stove plate	23.00 to 24.00
Pipes and flues	20.00 to 20.50

Philadelphia

Markets All Quiet, but Prices Hold Except on Old Material

PHILADELPHIA, April 17.—Buyers have deserted the market except to inquire in a small way for various materials for prompt delivery. Large tonnages have almost dropped out of sight, even in structural work, but the recent inquiry of the Pennsylvania Railroad for 3500 tons or more of plates and shapes, which has been wholly or partially closed, stands out as an exception. In pig iron the quietness of the market is more pronounced than in finished steel. Buyers seem to have become persuaded that prices are going no higher, at least for the present, and are even looking for concessions when they inquire. Today's large production is amply taking care of the foundry iron demand and at least one furnace interest in this district is piling a part of its make. Prices are holding fairly well on iron, though there have been slight concessions here and there, usually to meet freight rate differentials. The steel market continues very strong and emphasis is repeatedly placed by the mills on the fact that practically no speculative buying has been done as was so frequently the case in 1920.

The scrap market shows further weakness, and heavy melting steel is obtainable at \$23 to \$24, delivered. Labor shortage is everywhere commented upon. One Eastern steel company is importing negro labor from the South. This shortage is causing restriction upon output of consumers as well as producers of steel. Shortage of some lines of steel, particularly blue annealed sheets, is also making itself felt, and several consumers of blue annealed have been obliged to curtail work to three or four days a week, owing to this acute shortage.

Pig Iron.—There is scarcely enough business in pig iron to indicate any definite trend, but it is plain from

the attitude of buyers that they do not believe prices are going any higher, for the present at least, and some of them have been endeavoring to obtain concessions, without much success thus far, except that in certain instances slight shading has been done to meet lower freight rates. Eastern furnaces have more tonnage on order for May and June than for this month. One furnace interest, which a few weeks ago was virtually out of the market, is now offering iron for prompt shipment and is not selling its entire make, some iron being piled. Quotations continue on the basis of \$31 for No. 2 plain, \$32 for No. 2X and \$33 for No. 1X. Slight reductions in the minimum prices in the table below do not actually mean a lower price f.o.b. furnace, but are due to the fact that a furnace with a low freight rate to Philadelphia is back in the market and its delivered prices are 38c. per ton below those recently quoted in this table. Virginia iron for prompt shipment is offered at \$28.50, furnace, for No. 2 plain and for May and June and third quarter at \$29 to \$29.50, base, furnace. The Bethlehem Steel Co. will increase its output of merchant iron by putting two Lebanon furnaces in blast soon. The North Cornwall furnace has not been operated in years. One of the North Lebanon stacks will also go in. Foundry and low phosphorus iron will be made. Imports of foreign iron have not stopped, last week's receipts being 1862 tons from France and 1000 tons from England.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to \$1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$31.76 to \$32.64
East. Pa. No. 2X, 2.25 to 2.75 sil.	32.76 to 33.64
East. Pa. No. 1X,	33.76 to 34.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	33.67 to 34.17
Virginia No. 2X, 2.25 to 2.75 sil.	34.67 to 35.17
Basic delivered eastern Pa.	31.00 to 31.50
Gray forge	31.00 to 31.50
Malleable	33.14 to 33.64
Standard low phos. (f.o.b. furnace), nominal	35.00
Copper bearing low phos. (f.o.b. furnace)	33.00

Foreign Pig Iron

All prices f.o.b. cars Philadelphia, duty paid.	
Continental foundry, 1.80 to 2.50 sil.	\$31.00
Continental foundry, 2.50 to 3 sil.	32.00
Low phos., copper free, guar. not over 0.035 per cent phos.	35.36
Continental, phos. 1.50; sil. 2 to 3.	\$1.50

Ore.—Last week receipts of ore from abroad included 9050 tons of iron ore from French Africa, 7544 tons of iron ore from Sweden and 1500 tons of chrome ore from British India. Small lots of manganese ore continue to come in from Germany, last week six tons having arrived.

Coke.—Blast furnace coke is offered at prices ranging from \$6.25 to \$7, Connellsville, according to grade, the best quality being \$6.75 to \$7. Foundry coke of first quality is generally quoted at \$8.

Ferroalloys.—British makers of ferromanganese last week put up their price to \$117.50, duty paid, Atlantic seaboard, and on Monday made a further advance to \$120. The leading domestic producer has no prices at the moment, but would probably quote not less than the prices of the imported. Spiegeleisen for early delivery is very scarce and the limited quantities that are available are being offered at \$55, a few sales having been made at this figure.

Semi-Finished Steel.—Forging billets are in fairly good demand and are now difficult to obtain at less than \$55, Pittsburgh. A sale of 1000 tons of ordinary billets, not chipped, but for forging use was made at \$53, Pittsburgh. Open-hearth rerolling billets are quoted at \$45 to \$47.50, Pittsburgh, but mills are not anxious for business.

Plates.—Last week the Lukens Steel Co. made the best production record in more than two years, and this was done despite a shortage of labor. The plant is operating at about 80 per cent. Though one or two mills are well sold up for several months, plates are obtainable for delivery in from four to eight weeks at prices ranging from 2.65c. to 2.75c., Pittsburgh. One mill is quoting 2.85c. The Pennsylvania Railroad bought some or all of the 3500 tons of plates and shapes, for

which it recently inquired, at 2.45c., Pittsburgh. Locomotive business continues active and a good deal of work is still being figured on.

Structural Material.—The Philadelphia Inquirer Building, about 6800 tons of steel, is the largest structural steel work which has been let in this district in some time. It was taken by the American Bridge Co. There is a falling off in new projects, but mills and fabricators are booked for months. The minimum price on shapes for reasonably early delivery is 2.50c., Pittsburgh, while Eastern mills able to make fairly prompt delivery quote 2.85c. and 3c., mill.

Bars.—Steel bars are occasionally sold at 2.50c., Pittsburgh, but where fairly early delivery is wanted the buyer is usually obliged to pay 2.75c. The larger mills are sold up for periods ranging from three to five months. Bar iron continues to be quoted at 2.50c., Pittsburgh, for carloads and at 2.80c. for less than carloads.

Sheets.—A serious shortage of blue-annealed sheets has developed, and some of the range boiler manufacturers are particularly affected, as stated above. Black and galvanized sheets are also in limited supply.

Warehouse Business.—Jobbers are more seriously concerned with the problem of keeping up stocks than with making sales, for they can easily sell more than they can get from the mills. Prices are firm at the recent advance. For local delivery we quote:

Soft steel bars and small shapes, 3.55c.; iron bars (except bands), 3.55c.; round edge iron, 3.75c.; round edge steel, iron finished, $1\frac{1}{2}$ x $\frac{1}{2}$ in., 3.75c.; round edge steel planished, 4.55c.; tank steel plates, $\frac{1}{4}$ in. and heavier, 3.65c.; tank steel plates, $\frac{1}{2}$ in., 3.95c.; blue annealed steel sheets, No. 10 gage, 4.25c.; black sheets, No. 28 gage, 5.15c.; galvanized sheets, No. 28 gage, 6.25c.; square twisted and deformed steel bars, 3.65c.; structural shapes, 3.65c.; diamond pattern plates, $\frac{1}{4}$ -in., 5.40c.; $\frac{1}{2}$ -in., 5.60c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.75c.; narrower than 1 in., all gages, 5.25c.; steel bands, No. 12 gage to $\frac{1}{2}$ -in., inclusive, 4.35c.; rails, 3.55c.; tool steel, 8.50c.; Norway iron, 7c.

Old Material.—Neither mills nor brokers are exerting any pressure, and the market is being allowed to drift, with the result that prices show further weakness. Although the mills will eventually need considerable tonnages of scrap, dealers show no disposition to lay in stocks, and the mills are taking only such tonnages as they have under contract or that which is offered to them at prices which they are willing to pay. No. 1 heavy melting steel is available at \$23 to \$24, and some other grades are off correspondingly.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$23.00 to \$24.00
Scrap rails	23.00 to 24.00
Steel rails for rolling.....	26.00 to 27.00
No. 1 low phos., heavy 0.04 and under	30.00 to 31.00
Cast iron car wheels.....	26.00 to 27.00
No. 1 railroad wrought.....	27.00 to 28.00
No. 1 yard wrought.....	24.00 to 25.00
No. 1 forge fire.....	20.00 to 21.00
Bundled sheets (for steel works)	20.00 to 21.00
No. 1 busheling.....	23.00 to 24.00
Mixed borings and turnings for blast furnace use	17.50 to 18.50
Machine shop turnings (for steel works use)	20.00 to 21.00
Machine shop turnings (for rolling mill use).....	20.50 to 21.50
Heavy axle turnings (or equivalent)	21.50 to 22.50
Cast borings (for steel works and rolling mills)	20.00 to 21.00
Cast borings (for chemical plants)	24.00 to 26.00
No. 1 cast.....	26.00 to 28.00
Heavy breakable cast (for steel plants)	24.00 to 25.00
Railroad grate bars	22.00 to 23.00
Stove plate (for steel plant use)	21.00 to 22.00
Railroad malleable	24.00 to 26.00
Wrought iron and soft steel pipes and tubes (new specifications)	20.00 to 21.00
Shafting	26.00 to 28.00
Steel axles	28.00 to 30.00

Eastern rights to the method of making sash weights patented by George W. Gillespie, and described in THE IRON AGE of April 5, have been obtained by Levering Brothers, iron founders, Baltimore.

STEEL AND INDUSTRIAL STOCKS

Reactionary Tendency Prevails Despite Encouraging News

Throughout another week of listless trading, steel and industrial stocks failed to show any recuperative bent, disregarding several bits of news which should have encouraged and, ordinarily, would have strengthened. Industrials went to lower levels at the start, and both Republic and Gulf States Steel dropped. In the case of Republic, there was concentrated selling, but the subsequent move added three points on urgent demand, obviously in hopes that the postponed quarterly report would show good earnings. Nervousness died out near midweek and an undertone of strength was felt thenceforth to the end of the week. There is still accumulation of Crucible in anticipation of dividends. Steel was prominent throughout and held steady against the downward pressure. Industrials picked up toward the end and showed signs of strengthening. Equipments are held closely on the optimistic announcement of the railroad executives. The weekly average for 20 industrials was 101.8 against 102.7 last week.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	48 $\frac{1}{2}$	49 $\frac{1}{2}$	Inland Steel.....	45	46 $\frac{1}{2}$
Allis-Chal. pf....	94 $\frac{1}{2}$	94 $\frac{1}{2}$	Int. Har.....	88	90
Am. B. S. & Fdy. 77 $\frac{1}{2}$	79 $\frac{1}{2}$	79 $\frac{1}{2}$	Int. Har. pf.....	113	114
Am. B. S. & F. pf. 107 $\frac{1}{2}$	108 $\frac{1}{2}$	108 $\frac{1}{2}$	Lima Loco.....	70 $\frac{1}{2}$	73
American Can....	94 $\frac{1}{2}$	98 $\frac{1}{2}$	Midvale Steel....	31 $\frac{1}{2}$	32 $\frac{1}{2}$
Am. Can pf.....	107	108	Nat.-Acme	14 $\frac{1}{2}$	14 $\frac{1}{2}$
Am. Car & Fdry. 178	180	180	Nat. En. & Stm. 68 $\frac{1}{2}$	69 $\frac{1}{2}$	69 $\frac{1}{2}$
Am. Car & F. pf. 120	120	120	N. Y. Air Brake 37	39 $\frac{1}{2}$	39 $\frac{1}{2}$
American Loco... 132 $\frac{1}{2}$	136 $\frac{1}{2}$	136 $\frac{1}{2}$	Nova Scotia Stl. 25	25 $\frac{1}{2}$	25 $\frac{1}{2}$
Am. Loco. pf....	116 $\frac{1}{2}$	116 $\frac{1}{2}$	Otis Steel.....	12 $\frac{1}{2}$	13 $\frac{1}{2}$
Am. Radiator....	83	84 $\frac{1}{2}$	Otis Steel pf....	65 $\frac{1}{2}$	65 $\frac{1}{2}$
Am. Stl. Fdries. 38 $\frac{1}{2}$	40 $\frac{1}{2}$	40 $\frac{1}{2}$	Pittsburgh Stl. pf. 38	38	38
Am. Stl. Fd. pf. 100 $\frac{1}{2}$	100 $\frac{1}{2}$	100 $\frac{1}{2}$	Pressed Steel....	66	68
Baldwin Loco... 137 $\frac{1}{2}$	140 $\frac{1}{2}$	140 $\frac{1}{2}$	Ry Steel Spring. 116 $\frac{1}{2}$	118	118
Bethlehem Steel. 64 $\frac{1}{2}$	65 $\frac{1}{2}$	65 $\frac{1}{2}$	Replodge Steel... 25 $\frac{1}{2}$	26 $\frac{1}{2}$	26 $\frac{1}{2}$
Beth. Stl. pf. New 93 $\frac{1}{2}$	94 $\frac{1}{2}$	94 $\frac{1}{2}$	Republic	61 $\frac{1}{2}$	65 $\frac{1}{2}$
Beth. Stl. 8% pf. 108 $\frac{1}{2}$	108	108	Republic pf.....	95 $\frac{1}{2}$	96
Brier Hill.....	17 $\frac{1}{2}$	17 $\frac{1}{2}$	Sloss	53 $\frac{1}{2}$	54 $\frac{1}{2}$
Br. Em. Steel....	8	8	Sloss, pf.....	85	86
Br. Em. Stl. 1 pf. 23	23 $\frac{1}{2}$	23 $\frac{1}{2}$	Steel of Canada. 75 $\frac{1}{2}$	76 $\frac{1}{2}$	76 $\frac{1}{2}$
Chic. Pneu. Tool. 83	85 $\frac{1}{2}$	85 $\frac{1}{2}$	Superior Stl 1 pf. 98 $\frac{1}{2}$	98 $\frac{1}{2}$	98 $\frac{1}{2}$
Colo. Fuel.....	27	27	Un. Alloy Steel. 36 $\frac{1}{2}$	37	37
Crucible Steel....	78	82 $\frac{1}{2}$	U. S. Pipe.....	29 $\frac{1}{2}$	29 $\frac{1}{2}$
Crucible Steel pf. 91	91 $\frac{1}{2}$	91 $\frac{1}{2}$	U. S. Steel	105 $\frac{1}{2}$	107 $\frac{1}{2}$
Deere pf.....	70	71	U. S. Steel pf....	117 $\frac{1}{2}$	118 $\frac{1}{2}$
Gen. Electric....	180 $\frac{1}{2}$	183 $\frac{1}{2}$	Vanadium Steel. 39 $\frac{1}{2}$	41 $\frac{1}{2}$	41 $\frac{1}{2}$
Gt. No. Ore Cert. 32	33	33	Va. I. C. & Coke. 63	64	64
Gulf States Steel 97 $\frac{1}{2}$	100 $\frac{1}{2}$	100 $\frac{1}{2}$	W'house Air Br. 116	118	118
Gulf State Stl. pf. 105	105 $\frac{1}{2}$	105 $\frac{1}{2}$			

Industrial Finance

The Sloss Sheffield Steel & Iron Co. shows net profit for 1922 of \$578,893 after interest, depreciation, etc., as compared with a net loss of \$1,113,417 in 1921. Operating profits were \$1,394,109 as against \$1,150,289 in previous year, and surplus was \$578,893 as compared with \$1,732,417. The balance sheet shows working capital of \$1,255,459 and surplus of \$6,962,988. Earnings last year after allowing for preferred stock dividends were equivalent to \$1.09 per share earned on the \$10,000,000 common stock.

Officials of the Iron Products Corporation, as a part of the recapitalization plan, have changed the name of the company to the Universal Pipe & Radiator Co. Incorporated under Delaware laws, the new company has a capital stock of 90,000 shares of 7 per cent cumulative preferred, \$100 par value, and 180,000 shares of common stock without par value.

Net earnings of Gulf States Steel Co. for the first quarter of 1923 are estimated at close to \$600,000, which would be equivalent after preferred dividends, which amount to only \$35,900, to approximately \$5 per share on the 112,120 shares of common.

Income account of the Phelps Dodge Corporation and subsidiary companies for 1922 shows net loss after depreciation, depletion and interest of \$5,825,631. Regular dividends to the amount of 4 per cent were declared during the year. President Walter Douglas reports marked decrease in costs through heavy expenditures on mechanical installation.

By order of the U. S. District Court, the property of the bankrupt Republic Motor Truck Co., Alma, Mich., will be sold on May 3 at Ithaca, Mich. The property includes the land, plant, equipment, materials, patents, entire capital stock of the Republic Truck Sales Corporation, all the indebtedness of this corporation to the Republic company, amounting to \$3,687,766; good will and certain notes.

The petition for the dissolution of the Ryan-Bohn Foundry Co., Lansing, Mich., was allowed by the court, and John W. Willford, temporary receiver, was appointed permanent receiver for the company.

FABRICATED STEEL BUSINESS

March Bookings a New High Record—Promise Good of Jobs Yet to Develop

WASHINGTON, April 17.—Figures compiled by the Bureau of the Census show that new high records were established in sales of fabricated structural steel during March. The data on fabricated structural steel is based upon figures received by the Department of Commerce through the bureau in cooperation with the Structural Steel Society. March sales amounted to 95 per cent of shop capacity, as against 80 per cent in February and 89 per cent in April, 1922, the previous high record at the present shop capacity.

Total sales reported for March by 153 firms, with a shop capacity of 220,790 tons per month, amounted to 210,716 tons, the first time that actually reported tonnage has exceeded 200,000 tons in any month.

Fabricating shops are generally well engaged for many months, such capacity as is not yet under commitment being likely to be taken up with the steady run of current business. Against a normal seasonal slowing up is looming up a large total of work held up temporarily for one reason or another, but likely to supply a large continuing volume in the next few months. Numerous school buildings for New York are being pressed upon contractors—perhaps a score or more in 60 or 90 days—and considerable railroad bridgework is expected with a 50,000 to 60,000-ton structure across the Newark meadows at New York, for the Central Railroad of New Jersey, a noteworthy prospect.

Awards of the week include the following:

The Hegeman-Harris Co., apartment building, Nineteenth Street, New York, 110 tons, to Atlantic Structural Co.

School house, New Rochelle, N. Y., 400 tons, to unnamed fabricator.

Social service building, Philadelphia, 800 tons, to New York Shipbuilding Co.

Biltmore Hotel, Atlanta, involving 2300 tons, to be built of concrete instead of structural steel on account of the time factor.

Delaware River bridge wire towers for Pennsylvania Railroad, 300 tons, to Belmont Iron Works.

Y. M. C. A. building, Orange, N. J., 300 tons, to Charles Goeller Construction Co.

Addition to Johns-Manville Building, Madison Avenue, New York, 1500 tons, to American Bridge Co.

Potomac Electric Power Co., 900 tons, to an unnamed fabricator.

Delaware, Lackawanna & Western Railroad, 1000 tons of bridge material, to American Bridge Co.

Oil storage tanks for the U. S. Navy, Portsmouth, N. H., 1400 tons, to an unnamed fabricator.

Philadelphia Inquirer, 6800 tons, to American Bridge Co.

Apartment building, Lexington Avenue, 400 tons, to Paterson Bridge Co.

Apartment building, West Seventy-fourth Street, 500 tons, to George A. Just Co.

Bank building, Hazelton, Pa., 450 tons, to Fagan Iron Works, Jersey City, N. J.

United Railways Co. of St. Louis, additions to South Side shop No. 2, St. Louis, 107 tons, to Missouri Bridge & Iron Co.

Western Pacific viaduct, Keddle, Cal., 345 tons, to United States Steel Products Co.

Union Pacific System, truss spans and one 90-ft. girder span, 2382 tons, to American Bridge Co.; and plate girder spans, 1350 tons, to McClintic-Marshall Co.

Illinois Central, miscellaneous bridge work, 600 tons, to American Bridge Co.; and 70 tons, to Virginia Bridge & Iron Co.

Office building, Columbus, Ohio, 800 tons, to Fort Pitt Bridge Co.

Additional stories on Broadway Exchange, Wisconsin Telephone Co., Milwaukee, 700 tons, to Worden-Allen Co.

Steel work on eight pump stations for Kansas and Nebraska pipe lines of Sinclair Oil Co., 400 tons, to Wisconsin Bridge & Iron Co.

Tainter gates and structural steel for hydroelectric power plant, sulphate mill, etc., for Tomahawk Kraft Paper Co., Tomahawk, Wis., 350 tons, to Wausau Iron Works.

Elks' Club, Wausau, Wis., 150 tons, to Wausau Iron Works.

Buffalo, Rochester & Pittsburgh Railroad, bridges, 300 tons, to American Bridge Co.

City Deposit Bank Building addition, Pittsburgh, 100 tons, to Jones & Laughlin Steel Corporation.

Union Pacific Railroad, bridges, 1200 tons, to McClintic-Marshall Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Public service power house extension, Marion, N. J., 400 tons.

School house, New Haven, 1000 tons.

Four school houses, New York, 5300 tons.

Store and office building, Atlantic City, N. J., 300 tons.

Highway bridge, Johnstown, Pa., 700 tons.

Peabody Museum, Yale University, 500 tons.

Federal Reserve Bank, St. Louis, 2500 tons, Westlake Construction Co. general contractor.

Elks' Building, Williamsport, Pa., 350 tons.

Sinclair Refining Co., paint and car shop, Marcus Hook, Pa., 200 tons, bids in.

Elks' Club House, Milwaukee, 2470 tons, bids in.

Hotel at Portsmouth, Ohio, 100 tons, bids being taken.

Young Women's Christian Association Building, Erie, Pa., 270 tons.

Stern & Mann Co., Canton, Ohio, alterations and addition to store building, 200 tons.

The Great Northern Railway Co. is asking for delivery in early 1924 on 790 tons of steel ore spouts and 1450 tons of structural steel door frames, chutes and other parts for an ore dock.

RAILROAD EQUIPMENT BUYING

Sustained Repair Program Adopted for Both Cars and Locomotives

Under the program unanimously adopted by the railroads at meetings in New York the number of freight cars awaiting repairs is to be reduced to 5 per cent of the total equipment of the country by Oct. 1, and the number of locomotives awaiting heavy repairs to be reduced by 15 per cent.

Orders and inquiries of the week include:

The Virginian Railway has placed an order with the Pressed Steel Car Co. for 1000 120-ton all-steel gondolas, and with the Standard Steel Car Co. for 500 70-ton all-steel hopper cars. From 25,000 to 30,000 tons of steel will be required.

The Ann Arbor Railroad is inquiring for 500 40-ton automobile cars.

The Nitrate Railways of Chile are in the market for 300 flat cars.

The New England Oil Refining Co., Boston, has contracted with the General American Tank Car Corporation for 250 tank cars.

The Canadian Pacific Railroad has placed an order with the Canadian Car & Foundry Co. for 12 baggage and mail cars, 6 cafe, 6 buffet and 300 gondola cars, and for 300 flat cars with the Eastern Car Co.

A railroad, as yet unnamed, has placed an order with the American Locomotive Co. for 40 locomotives.

The Kansas City Southern has ordered 10 locomotives from the Baldwin Locomotive Works.

The Chesapeake & Ohio Railroad has placed 25 Mallet type locomotives with the American Locomotive Co.

The New York Central has ordered 2000 refrigerator cars from the Merchants Despatch Transportation Co.

The Elgin, Joliet & Eastern is inquiring for 500 underframes.

The Missouri Pacific is inquiring for 200 box cars.

The Symington Co. has let 2500 underframes to the Virginia Bridge & Iron Co.

The Sterling Salt Co. has placed 14 dump cars with the Pressed Steel Car Co.

The Hocking Valley has placed 1000 automobile cars each with the Standard Steel Car Co. and the American Car & Foundry Co.

The Norfolk & Western has awarded repairs on 293 hopper cars to the Virginia Bridge & Iron Co. and on 700 cars to the Ralston Steel Car Co.

The Phillips Petroleum Co. has placed 100 tank cars with the Standard Tank Car Co.

The Roxanna Petroleum Co. has ordered 459 tank cars from the Standard Tank Car Co.

The Chesapeake & Ohio has placed 1000 hopper car repairs with the Richmond Car Works.

The Illinois Central has placed 14 baggage and horse cars with the Standard Steel Car Co. and 6 cafe and lounge cars with the Pullman Co.

The Kansas City Southern is inquiring for 10 Mallet type locomotives.

The Florida East Coast is in the market for 15 Pacific type and five 6-wheel type switch engines.

The Boston & Albany placed eight 8-wheel switch engines with the Lima Locomotive Co.

Prices Finished Iron and Steel f.o.b. Pittsburgh

For additional prices, see page 1143

Plates	
Sheared, tank quality, base, per lb.	2.45c. to 2.75c.
Structural Material	
Beams, channels, etc.	2.45c. to 2.60c.
Sheet piling	2.60c. to 2.75c.

Iron and Steel Bars	
Soft steel bars, base, per lb.	2.35c. to 2.75c.
Refined iron bars, base, per lb.	3.25c.
Double refined iron bars, base per lb.	4.85c. to 5.00c.
Stay bolt iron bars, base, per lb.	8.00c. to 8.50c.

Hot-Rolled Flats	
Hoops, ordinary gages and widths, base, per lb.	3.30c. to 3.50c.
Hoops, light gage, under 1 in. wide.	3.50c. to 3.75c.
Bands, base, per lb.	3.30c. to 3.50c.
Strips, base, per lb.	3.25c. to 3.50c.

Cold-Finished Steels	
Bars and shafting, base, per lb.	3.00c. to 3.10c.
Strips, base, per lb.	5.25c. to 5.50c.

Wire Products	
Nails, base, per keg.	\$2.90 to \$3.10
Galvanized nails, 1 in. and over.	\$2.25 over base
Galvanized nails, less than 1 in.	\$2.50 over base
Bright plain wire, base, No. 9 gage per 100 lb.	\$2.65 to \$3.00
Annealed fence wire, base, per 100 lb.	2.80 to 3.20
Spring wire, base, per 100 lb.	3.60
Galvanized wire, No. 9, base, per 100 lb.	3.25 to 3.60
Galvanized barbed, base, per 100 lb.	3.70 to 3.90
Galvanized staples, base, per keg.	3.70 to 3.90
Painted barbed wire, base, per 100 lb.	3.35 to 3.45
Polished staples, base, per keg.	3.35 to 3.45
Cement coated nails, base, per count keg.	2.60 to 2.75
Woven fence, carloads (to jobbers) 67½ to 66½ per cent off list	
Woven fence, carloads (to retailers) .65 to 64 per cent off list	

Bolts and Nuts	
Machine bolts, small, rolled threads.	.50 per cent off list
Machine bolts, small, cut threads.	.40 and 10 per cent off list
Machine bolts, larger and longer.	.40 and 10 per cent off list
Carriage bolts, ¾ x 6 in.	
Smaller and shorter, rolled threads.	.45 per cent off list
Cut threads	.40 per cent off list
Longer and larger sizes	.40 per cent off list
Lag bolts	.50 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads.	.40 and 10 per cent off list
Other style heads	.20 per cent extra
Machine bolts, c.p.c. and t. nuts, ¾ x 4 in.	
Smaller and shorter	.35 and 5 per cent off list
Larger and longer sizes	.35 and 5 per cent off list
Hot pressed square or hex. nuts, blank.	\$3.00 off list
Hot pressed nuts, tapped	2.75 off list
C.p.c. and t. square or hex. nuts, blank.	3.00 off list
C.p.c. and t. square or hex. nuts, tapped.	2.75 off list
Semi-finished hex. nuts:	
¾ in. and smaller, U. S. S.	.75 and 5 per cent off list
¾ in. and larger, U. S. S.	.70 and 2½ per cent off list
Small sizes, S. A. E.	.75, 10 and 5 per cent off list
S. A. E., ¾ in. and larger.	.75, 10 and 2½ per cent off list
Stove bolts in packages.	.75, 10 and 5 per cent off list
Stove bolts in bulk.	.75, 10, 5 and 2½ per cent off list
Tire bolts	.50, 10 and 10 per cent off list

Cap and Set Screws	
Milled square and hex. head cap screws.	.70 and 10 per cent off list
Milled set screws.	.70 and 10 per cent off list
Upset cap screws.	.75 per cent off list
Upset set screws.	.75 per cent off list

Rivets	
Large structural and ship rivets, base, per 100 lb.	\$3.25 to \$3.50
Large boiler rivets, base, per 100 lb.	3.35 to 3.60
Small rivets	.60 and 10 to 60 and 5 off list

Track Equipment	
Spikes, ¾ in. and larger, base, per 100 lb.	\$3.15
Spikes, ½ in. and ¾ in., per 100 lb.	3.75
Spikes, ¾ in.	3.75
Spikes, boat and barge, base, per 100 lb.	\$3.50 to 3.75
Track bolts, ¾ in. and larger, base, per 100 lb.	4.00 to 4.50
Track bolts, ½ in. and ¾ in., base, per 100 lb.	5.00 to 5.50
Tie plates, per 100 lb.	2.55 to 2.60
Angle bars, base, per 100 lb.	2.75

Welded Pipe	
Butt Weld	
Inches	Steel
1/2	Black 47
3/4	Black 53
1	Black 58
1 1/4	Black 62
1 1/2	Black 64
2	Black 71
2 1/2	Black 78
3	Black 85
3 1/2	Black 92
4	Black 99
4 1/2	Black 106
5	Black 113
5 1/2	Black 120
6	Black 127
6 1/2	Black 134
7	Black 141
7 1/2	Black 148
8	Black 155
8 1/2	Black 162
9	Black 169
9 1/2	Black 176
10	Black 183
10 1/2	Black 190
11	Black 197
11 1/2	Black 204
12	Black 211
12 1/2	Black 218
13	Black 225
13 1/2	Black 232
14	Black 239
14 1/2	Black 246
15	Black 253
15 1/2	Black 260
16	Black 267
16 1/2	Black 274
17	Black 281
17 1/2	Black 288
18	Black 295
18 1/2	Black 302
19	Black 309
19 1/2	Black 316
20	Black 323
20 1/2	Black 330
21	Black 337
21 1/2	Black 344
22	Black 351
22 1/2	Black 358
23	Black 365
23 1/2	Black 372
24	Black 379
24 1/2	Black 386
25	Black 393
25 1/2	Black 400
26	Black 407
26 1/2	Black 414
27	Black 421
27 1/2	Black 428
28	Black 435
28 1/2	Black 442
29	Black 449
29 1/2	Black 456
30	Black 463
30 1/2	Black 470
31	Black 477
31 1/2	Black 484
32	Black 491
32 1/2	Black 498
33	Black 505
33 1/2	Black 512
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34 1/2	Black 526
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35 1/2	Black 540
36	Black 547
36 1/2	Black 554
37	Black 561
37 1/2	Black 568
38	Black 575
38 1/2	Black 582
39	Black 589
39 1/2	Black 596
40	Black 603
40 1/2	Black 610
41	Black 617
41 1/2	Black 624
42	Black 631
42 1/2	Black 638
43	Black 645
43 1/2	Black 652
44	Black 659
44 1/2	Black 666
45	Black 673
45 1/2	Black 680
46	Black 687
46 1/2	Black 694
47	Black 701
47 1/2	Black 708
48	Black 715
48 1/2	Black 722
49	Black 729
49 1/2	Black 736
50	Black 743
50 1/2	Black 750
51	Black 757
51 1/2	Black 764
52	Black 771
52 1/2	Black 778
53	Black 785
53 1/2	Black 792
54	Black 799
54 1/2	Black 806
55	Black 813
55 1/2	Black 820
56	Black 827
56 1/2	Black 834
57	Black 841
57 1/2	Black 848
58	Black 855
58 1/2	Black 862
59	Black 869
59 1/2	Black 876
60	Black 883
60 1/2	Black 890
61	Black 897
61 1/2	Black 904
62	Black 911
62 1/2	Black 918
63	Black 925
63 1/2	Black 932
64	Black 939
64 1/2	Black 946
65	Black 953
65 1/2	Black 960
66	Black 967
66 1/2	Black 974
67	Black 981
67 1/2	Black 988
68	Black 995
68 1/2	Black 1002
69	Black 1009
69 1/2	Black 1016
70	Black 1023
70 1/2	Black 1030
71	Black 1037
71 1/2	Black 1044
72	Black 1051
72 1/2	Black 1058
73	Black 1065
73 1/2	Black 1072
74	Black 1079
74 1/2	Black 1086
75	Black 1093
75 1/2	Black 1100
76	Black 1107
76 1/2	Black 1114
77	Black 1121
77 1/2	Black 1128
78	Black 1135
78 1/2	Black 1142
79	Black 1149
79 1/2	Black 1156
80	Black 1163
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82 1/2	Black 1198
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84 1/2	Black 1226
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85 1/2	Black 1240
86	Black 1247
86 1/2	Black 1254
87	Black 1261
87 1/2	Black 1268
88	Black 1275
88 1/2	Black 1282
89	Black 1289
89 1/2	Black 1296
90	Black 1303
90 1/2	Black 1310
91	Black 1317
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94 1/2	Black 1366
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95 1/2	Black 1380
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121 1/2	Black 1744
122	Black 1751
122 1/2	Black 1758
123	Black 1765
123 1/2	Black 1772
124	Black 1779
124 1/2	Black 1786
125	Black 1793
125 1/2	Black 1800
126	Black 1807
126 1/2	Black 1814
127	Black 1821
127 1/2	Black 1828
128	Black 1835
128 1/2	Black 1842
129	Black 1849
129 1/2	Black 1856
130	Black 1863
130 1/2	Black 1870
131	Black 1877
131 1/2	Black 1884
132	Black 1891
132 1/2	Black 1898
133	Black 1905
133 1/2	Black 1912
134	Black 1919
134 1/2	Black 1926
135	Black 1933
135 1/2	Black 1940
136	Black 1947
136 1/2	Black 1954
137	Black 1961
137 1/2	Black 1968
138	Black 1975
138 1/2	Black 1982
139	Black 1989
139 1/2	Black 1996
140	Black 2003
140 1/2	Black 2010
141	Black 2017
141 1/2	Black 2024
142	Black 2031
142 1/2	Black 2038
143	Black 2045
143 1/2	Black 2052
144	Black 2059
144 1/2	Black 2066
145	Black 2073
145 1/2	Black 2080
146	Black 2087
146 1/2	Black 2094
147	Black 2101
147 1/2	Black 2108
148	Black 2115
148 1/2	Black 2122
149	Black 2129
149 1/2	Black 2136
150	Black 2143
150 1/2	Black 2150
151	Black 2157
151 1/2	Black 2164
152	Black 2171
152 1/2	Black 2178
153	Black 2185
153 1/2	Black 2192
154	Black 2199
154 1/2	Black 2206
155	Black 2213
155 1/2	Black 2220
156	Black 2227
156 1/2	Black 2234
157	Black 2241
157 1/2	Black 2248
158	Black 2255
158 1/2	Black 2262
159	Black 2269
159 1/2	Black 2276
160	Black 2283
160 1/2	Black 2290
161	Black 2297
161 1/2	Black 2304
162	Black 2311
162 1/2	Black 2318
163	Black 2325
163 1/2	Black 2332
164	Black 2339
164 1/2	Black 2346
165	Black 2353
165 1/2	Black 2360
166	Black 2367
166 1/2	Black 2374
167	Black 2381
167 1/2	Black 2388
168	Black 2395
168 1/2	Black 2402
169	Black 2409
169 1/2	Black 2416
170	Black 2423
170 1/2	Black 2430
171	Black 2437
171 1/2	Black 2444
172	Black 2451
172 1/2	Black 2458
173	Black 2465
173 1/2	Black 2472
174	Black 2479
174 1/2	Black 2486
175	Black 2493
175 1/2	Black 2500
176	Black 2507
176 1/2	Black 25

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron.....	\$6.45
Old range non-Bessemer, 51½ per cent iron.....	5.70
Messabi Bessemer, 55 per cent iron.....	6.20
Messabi non-Bessemer, 51½ per cent iron.....	5.55

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian.....	12c.
Iron ore, Swedish, average 66 per cent iron.....	9.5c. to 10c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus.....	45½c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus.....	43½c.
Manganese ore, Brazilian or Indian.....	45c.
Tungsten ore, per unit, in 60 per cent concentrates.....	\$7.50 to \$8.50
Chromite ore, basic, 48 per cent Cr ₂ O ₃ , crude per ton, c.i.f. Atlantic seaboard.....	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₂ , New York.....	60c. to 70c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, per ton.....	\$120.00 to \$125.00
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid.....	120.00 to 125.00
Spiegeleisen, foreign, 19 to 21 per cent, seaboard, per ton.....	45.00 to 55.00
Spiegeleisen, domestic, 16 to 19 per cent, furnace, per ton, nominal.....	39.00
Ferrosilicon, 50 per cent, delivered per gross ton.....	92.50 to 95.00
Ferrosilicon, Bessemer, 10 per cent, per ton, furnace.....	48.50
Ferrosilicon, Bessemer, 11 per cent, per ton, furnace.....	51.80
Ferrosilicon, Bessemer, 12 per cent, per ton, furnace.....	55.10
Ferrosilicon, Bessemer, 13 per cent, per ton, furnace.....	59.10
Ferrosilicon, Bessemer, 14 per cent, per ton, furnace.....	64.10
Silvery iron, 6 per cent, per ton, furnace.....	37.00
Silvery iron, 7 per cent, per ton, furnace.....	38.00
Silvery iron, 8 per cent, per ton, furnace.....	39.50
Silvery iron, 9 per cent, per ton, furnace.....	41.50
Silvery iron, 10 per cent, per ton, furnace.....	43.50
Silvery iron, 11 per cent, per ton, furnace.....	46.80
Silvery iron, 12 per cent, per ton, furnace.....	50.10
Ferrotungsten, per lb. contained metal.....	90c. to 95c.
Ferrocromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered.....	11.50c. to 12c.
Ferrovandium, per lb. contained vanadium.....	\$3.50 to \$4.00
Ferrocobaltitium, 15 to 18 per cent, per net ton.....	200.00

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica per net ton f.o.b. Illinois and Kentucky mines.....	\$20.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica per net ton, f.o.b. Illinois and Kentucky mines.....	21.50
Per 1000 f.o.b. works:	
Fire Clay:	
Pennsylvania.....	High Duty \$48.00 to \$51.00 Moderate Duty \$43.00 to \$46.00
Ohio.....	45.00 to 47.00 40.00 to 43.00
Kentucky.....	45.00 to 47.00 42.00 to 45.00
Illinois.....	48.00 to 50.00 45.00 to 47.00
Missouri.....	48.00 to 50.00 38.00 to 43.00
Ground fire clay, per net ton.....	6.50 to 9.50
Silica Brick:	
Pennsylvania.....	47.00
Chicago.....	52.00
Birmingham.....	48.00
Ground silica clay, per net ton.....	10.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	50.00

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$45.00 to \$47.50
Rolling billets, 2-in. and under.....	45.00 to 47.50
Forging billets, ordinary carbons.....	55.00
Sheet bars, Bessemer.....	45.00 to 47.50
Sheet bars, open-hearth.....	45.00 to 47.50
Slabs.....	45.00 to 47.50
Wire rods, common, soft base, No. 5 to ¼-in.....	49.00 to 55.00
Wire rods, common, soft, case, coarser than ¼-in.....	\$2.50 over base
Wire rods, screw stock.....	\$5 per ton over base
Wire rods, carbon 0.20 to 0.40.....	\$3 per ton over base
Wire rods, carbon 0.41 to 0.55.....	\$5 per ton over base
Wire rods, carbon 0.56 to 0.75.....	\$7.50 per ton over base
Wire rods, carbon over 0.75.....	\$10 per ton over base
Wire rods, acid.....	\$15 per ton over base
Skelp, grooved, per lb.....	2.35c. to 2.80c.
Skelp, sheared, per lb.....	2.35c. to 2.80c.
Skelp, universal, per lb.....	2.35c. to 2.80c.

Finished Iron and Steel, f.o.b. Mill

Rails, heavy, per gross ton.....	\$43.00
Rails, light, new steel, base, per lb.....	2.25c.
Rails, light, rerolled, base, per lb.....	2.25c.
Spikes, ¾-in. and larger, base, per 100 lb.....	\$3.15
Spikes, ½-in., ⅞-in. and ¾-in., base, per 100 lb.....	\$3.25 to 3.75
Spikes, ⅞-in., base, per 100 lb.....	3.25 to 3.75
Spikes, boat and barge, base, per 100 lb.....	3.50 to 3.75
Track bolts, ¾-in. and smaller, base, per 100 lb.....	4.25 to 5.50
Track bolts, ¾-in. and larger, base, per 100 lb.....	4.15 to 4.50
Tie plates, per 100 lb.....	2.55 to 2.60
Angle bars, per 100 lb.....	2.75
Bars, common iron, base, per lb.....	2.50c. to 2.60c.
Bars, rail, steel reinforcing, base, per lb.....	2.15c. to 2.35c.
Ground shafting, base, per lb.....	3.40c.
Cut nails, base, per keg.....	\$2.40

Alloy Steel

S.A.E. Series Numbers	Bars 100 lb.
2100 (½% Nickel, 10 to 20 per cent Carbon).....	\$3.75
2300 (3½% Nickel).....	5.75
2500 (5% Nickel).....	8.25
3100 (Nickel Chromium).....	4.75
3200 (Nickel Chromium).....	6.50
3300 (Nickel Chromium).....	8.75
3400 (Nickel Chromium).....	7.75
5100 (Chromium Steel).....	4.25
5200 (Chromium Steel).....	5.50
6100 (Chromium Vanadium bars).....	5.25
6100 (Chromium Vanadium spring steel).....	5.00
9250 (Silico Manganese spring steel).....	4.25
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....	5.75
Chromium Molybdenum bars (0.70-1 Chromium, 0.25-0.40 Molybdenum).....	5.25
Chromium Molybdenum spring steel (0.50-0.70 Chromium, 0.15-0.25 Molybdenum).....	5.00

Above prices are for hot-rolled alloy steel bars, forging quality, per 100-lb. f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are \$10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets down to and including 2½-in. sq. there is a size extra of \$10 per gross ton; on billets smaller than 2½-in. sq. the net ton bar price applies.

Coating Steel Pipe With Lead

A new process for coating steel piping or plates with lead was described by C. C. Lance, engineer of the National Boiler Washing Co., Chicago, in *Power* for March 27. Asserting that the galvanizing process affords no protection against acid fumes, the author says that it was thought that by combining lead with steel, or rather by coating steel with lead, a satisfactory protection under almost all conditions might be evolved. This method was tried out with success and an examination of some of the lead-coated pipes

installed at Topeka, Kan. in 1917 failed to show any deterioration, although in one instance the pipe examined had been buried in cinders for several years. Other piping had been subjected to constant moisture in a drainage manhole with practically no sign of deterioration. The original lead coating remained intact, the only indication of service being a slight blackening of the surface. The author gives a somewhat detailed description of the process of "leadizing" the steel, together with photographs of pipe as it appeared both before and after use under various sets of conditions.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York Straits			Lead		Zinc	
	Lake	Electro-lytic*	Tin New York	New York	St. Louis	New York	St. Louis
April							
11.....	17.25	16.87½	47.50	8.30	8.15	7.80	7.45
12.....	17.25	16.87½	46.50	8.25	8.15	7.80	7.45
13.....	17.25	16.75	46.50	8.25	8.15	7.77½	7.42½
14.....	17.25	16.75	....	8.25	8.15	7.77½	7.42½
15.....	17.25	16.75	46.00	8.25	8.15	7.75	7.40
16.....	17.25	16.75	45.30	8.25	8.15	7.70	7.35

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, April 17.

Demand for all the metals is light and the markets generally are easy. Buying of copper continues moderate at lower prices. There has been very little change in the demand or prices for Straits tin. The lead market is quiet and slightly easier. After a moderate advance the zinc market has again declined.

Copper.—As is usual under conditions such as at present exist, when the demand for electrolytic copper is light, prices have further receded and the metal is obtainable from dealers and custom smelters, and also one or two large producers, at as low as 17c., delivered, or a recession of ¼c. since a week ago. The demand which has appeared has been and is easily satisfied by such sellers and the market is quotable at 17c. to 17.25c., delivered, depending upon the seller. The market has sunk into an exceedingly inactive condition and just how long it will last is a matter of conjecture. Lake copper is quoted at 17.25c., delivered.

Tin.—The feature of the tin market has been the announcement on April 12 that the Federated Malay and Dutch Governments have decided upon a plan to liquidate the large stocks of Straits and Banca tin which have been hanging over the market for something like a year and a half or more. This metal, amounting to 17,000 or 18,000 tons, was bought during the depression in 1921 to protect the tin industry. It has been more or less of a menace to those engaged in this market ever since, because of rumors that it might be liquidated as a whole almost any time. The plan as announced is to the effect that this large quantity of tin will be sold during the next 20 months at 5 per cent a month, or about 850 to 900 tons. If in any month less than 5 per cent should be sold, the difference is to be made up the following month. It is understood that a minimum price, probably about £220 per ton, is to be agreed upon and if the market falls below this the metal would not be sold. In other words, the disposition of the metal is largely discretionary. This announcement is regarded in the trade as a bull factor by some and as a bearish one by others. Some look with favor upon the decision because an uncertainty has been removed and because it will work for a more stable market, especially in view of the fact that production is practically equal to consumption at the present time. The minimum prices referred to should also act as a check to any sudden or speculative advance. With the exception of April 10 and 11, when the market was fairly active, demand has been very light. On those days, 600 to 700 tons are estimated to have changed hands with dealers the principal participants and with consumers absent from the market. One dealer absorbed all the cheap lots he could obtain, while others were merely switching their position. Today, in a fairly active market, considerable business was done in Straits tin for all positions at 45.25c. to 45.37½c. The London market was lower today by about £3.50 per ton than a week ago at £211 15s. for spot standard, £212 for future standard and £221 15s. for spot Straits. Arrivals thus far this month have been 4405 tons with 6743 tons reported afloat.

Lead.—Developments in this market point to easier conditions despite opinions to the contrary. There

have been further importations of lead and the London prices have had considerable effect. The foreign metal is being offered broadcast at 8.20c., New York, duty paid, and the leading interest is a free seller at 8.25c., New York. Demand is characterized as not by any means brilliant. The St. Louis price in the outside market is 8.15c.

Zinc.—The statistics for March showed a further reduction in stocks and as a result the market experienced a moderate advance in the past week. This, however, has not been supported and, in the absence of any marked demand, prices have again receded until prime Western for April or May delivery is quoted at 7.30c. to 7.40c., St. Louis, or 7.65c. to 7.75c., New York.

Nickel.—Shot and ingot nickel are quoted unchanged at 29c. to 32c. and electrolytic nickel is held at 32c. by the leading producers. Shot and ingot nickel in the outside spot market are quoted at 29c. to 32c.

Antimony.—Chinese metal in wholesale lots for early delivery is quoted at 8.25c. to 8.35c. per lb., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery, is quoted by importers of the foreign product at 26.50c. per lb., New York, duty paid. No quotations are obtainable from the leading domestic producer.

Old Material.—The market continues sluggish and business is quiet. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible.....	16.25
Copper, heavy and wire.....	15.00
Copper, light and bottoms.....	13.00
Heavy machine composition.....	13.00
Brass, heavy.....	10.50
Brass, light.....	7.50
No. 1 red brass or composition turnings.....	12.00
No. 1 yellow red brass turnings.....	9.00
Lead, heavy.....	7.75
Lead tea.....	6.00
Zinc.....	5.25

Chicago

APRIL 17.—The metals are exceedingly quiet with copper lower and zinc slightly higher than a week ago. All of the old metals except the tin and lead grades have declined. We quote, in carload lots, lake copper, 17.25c.; tin, 48c.; lead, 8.25c.; spelter, 7.50c.; antimony, 10.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 13.75c.; copper bottoms, 12c.; red brass, 11.25c.; yellow brass, 8.50c.; lead pipe, 6.50c.; zinc, 4.75c.; pewter, No. 1, 29c.; tin foil, 33c.; block tin, 38c., all buying prices for less than carload lots.

Saving fuel in the operation of hand-fired return-tubular boiler plant has been investigated by the Department of the Interior through the fuel section of the Bureau of Mines. It was found that the average cost of fuel to produce 1000 lb. of steam was 52.87c. After some simple changes had been made in the furnaces, and in the control of the boilers, it was found that the cost per 1000 lb. of steam could be reduced to 35.4c. The savings are put at approximately 900 tons of coal in an eleven month period, and approximately \$12,500 in total fuel cost. The investigation is the subject of publication 2455, entitled "How Steam Production Costs Were Reduced in a Hand-Fired Return-Tubular Boiler Plant," by A. R. Mumford, assistant fuel engineer, and may be obtained from the Bureau of Mines at Washington.

The March industrial payroll at Youngstown was \$5,968,344, a decline of \$132,593 from the February distribution. It compares, however, with a payroll of but \$3,570,422 the corresponding month of 1922. The decline is attributed to the fact that the so-called March pay actually covers half of the short month of February. The wage disbursement at Youngstown for the first three months of 1923 was \$17,456,269, or at an annual rate of approximately \$70,000,000. During the first three months of 1922 industries at Youngstown paid out \$10,226,552 in wages.

British Iron and Steel Market

Ferromanganese Is Sharply Up for Both Export and Domestic Sales—Tin Plate Easier—Continental Markets Quiet

(By Cable)

LONDON, ENGLAND, April 17.

Labor outlook is brighter.

Pig iron is firm but quiet. Consumers are well covered. Cleveland producers are fully sold until June and are maintaining in general a cautious attitude toward further forward contracts.

Hematite is dull after recent heavy sales. Makers are sold partially into June. Prices are firm. Foreign ore is easier. Sellers of best Bilbao-Rubio ask 24½s. (\$5.70), ex-ship Tees.

Finished iron and steel is quieter and there are indications of price weakening in certain quarters. Makers generally, however, are well sold out. The Continent is a strong buyer of all kinds of finished steel. China has bought plates and sections. Other export markets are dull.

Staffordshire marked bars have been raised 10s. (\$2.33) to £14 10s. (\$67.43, or 3.01c. per lb.)—delivered to domestic customers; f.o.b., for export.

Continental business is almost stagnant. France has sold small lots of basic pig iron and Belgium has offered merchant bars at £9 5s. (1.92c. per lb.) f.o.b., 6 weeks' delivery, but there have been no buyers at that price.

In France the coke position is improving gradually. The Société Anonyme des Haut-Fourneaux et Fonderies de Pont-à-Mousson has blown in a furnace at d'Auboué. The market is quiet, with prices tending easier.

In Belgium the Société Anonyme des Haut-Fourneaux, Forges et Acieries de Thy-le-Chateau et Marcinelle has blown out a furnace because of coke shortage. Business is quiet.

Export Demand Very Heavy—No Competition from the Continent—German Stocks Accumulating

LONDON, ENGLAND, April 5.—Business in the iron and steel markets has been considerably interfered with by the Easter holidays, and as yet trading can hardly be said to have resumed. The main weekly meetings were not held this week. The pig iron and steel situation is one of considerable strength, and on all sides a shortage is reported. Prices are very firm, but in some directions it seems as though a halt has been called, buyers hesitating to pay the high values asked.

The output of Cleveland pig iron is sold out for three to four months ahead and merchant parcels also are scarce so that premiums are easily commanded for any spot supplies offered. Production could, of course, be increased to a large extent but, though here and there there are reports of furnaces being restarted, the very high cost of production is too great a hindrance to any general expansion.

The export demand both for raw and finished materials continues very strong—particularly for the continent—and a large business has been moving in pig iron and steel with Germany, and in a lesser degree with other parts of the continent. German buying is not confined to German merchants but purchasers, who in the ordinary run of things obtained their supplies from German works, are now sending their inquiries here. There is, of course, nothing to be feared in the way of competition from any of the continental sources of supply at present, and though now and again offers are made, the uncertainty as to delivery makes the buyer cautious. It is difficult to fully understand what is the position on the continent. Reports from there in-

Germany is feeling the effects of the Ruhr occupation. Many works are restricting operations.

Tin plate is a shade easier on second-hand offerings, down to 24¼s. (\$5.75) basis, IC, f.o.b. having been accepted, but makers still ask up to 25½s. (\$5.93), at which price the product is being sold heavily. There is some talk of advances in steel sheet bars. The export business generally is quiet. In the home trade, odd sizes have been done at 25s. (\$5.81) basis, IC, f.o.t. There is a shortage of raw material affecting tin plate deliveries, and some mills are closed.

Galvanized sheets are quiet. In black sheets there has been a revival of demand from the Far East, but little business is being done.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.65 per £1, as follows:

Durham coke, delivered	£2 2½s.	\$9.88
Cleveland No. 1 foundry	6 10†	30.23
Cleveland No. 3 foundry	6 5	29.06
Cleveland No. 4 foundry	6 5	29.06
Cleveland No. 4 forge..	6 2½	28.48
Cleveland basic	6 2½	28.48
East Coast mixed.....	6 5	29.06 to \$30.23
Ferromanganese	18 0	83.70
Ferromanganese*	18 0	83.70
Rails, 60 lb. and up....	10 0	46.50 to 48.83
Billets	9 10	44.17 to 46.50
Sheet and tin plate bars,		
Welsh	10 0	46.50
Tin plates, base box...	1 5	5.81 to 5.93
		C. per Lb.
Ship plates	10 5	2.13 to 2.23
Boiler plates	12 10	2.59 to 2.70
Tees	11 0	2.28 to 2.39
Channels	10 5	2.13 to 2.23
Beams	10 0	2.08 to 2.18
Round bars, ¾ to 3 in.	11 0	2.28 to 2.39
Galvanized sheets, 24 g.	19 10	4.05 to 4.15
Black sheets, 24 gage..	14 10	3.01 to 3.06
Black sheets, Japanese		
specifications	15 5	3.16
Steel hoops	11 0	2.28 & 2.70*
Cold rolled steel strip,		
20 g.	23 0	4.77
Cotton ties, Indian speci-		
fications	15 0	3.11

*Export price. †Nominal.

dicating that the trade is in a bad way. Certainly there is no material of importance being offered for export but, though a shortage of fuel is predominant, some of the works state that they are able to carry on and will deliver supplies against current contracts, more or less guaranteeing delivery in a short time, provided the buyer pays an increased price—generally about 20s.—a ton, the reason for this being that the makers have had to buy British fuel. In the meanwhile the German works seem to be going on steadily and, with stocks accumulating, the position is not exactly promising. However, works on this side have had everything practically their own way since the commencement of the continental debacle, and most of them are comfortably placed with orders.

May Build Citroën Automobile in United States

André Citroën, of Paris, France, who became prominent as a maker of gears before the war, who built and operated gigantic shell factories during the war, and who developed a low price automobile and converted his plants for their manufacture after the war, is spending three or four weeks in the United States, looking into the possibility of manufacturing his car in this country. He is interested particularly in a taxicab, which is of 10-hp. capacity, "with a 46-in. tread," doing 40 miles to the gallon on level roads, it is claimed, and 35 miles on hills, and selling in the United States for \$1,100. The Citroën works plan to turn out 35,000 automobiles this year, or a number said to approximate the production of all other French factories combined. He has an office in the Fisk Building, New York, in charge of Victor Baudin.

PERSONAL

The Bethlehem Steel Co. announces the following appointments of men who were in the sales organization of the Midvale Steel & Ordnance Co.: L. B. Morris, who was Midvale district sales manager in New York, becomes Pacific Coast representative for Bethlehem, with headquarters in the Monadnock Building, San Francisco. Alfred C. Howell, who was Midvale district sales manager in Philadelphia, and before that in charge of plate and structural sales in the general sales office, becomes plate sales agent of Bethlehem. L. R. Steuer, formerly in charge of the bar and billet division at the general sales office of Midvale in Philadelphia, has been placed in charge of general sales of billets, blooms, slabs, wire rods, other semi-finished products, wire products and Gautier shop specialties, with headquarters at Bethlehem, Pa. J. L. Adams becomes sales agent of Bethlehem in Cincinnati and J. E. McLain, the former Midvale sales manager in Pittsburgh, becomes sales agent there for Bethlehem.

Several of the former sales executives of the Midvale Steel & Ordnance Co. have been appointed to similar positions in the sales organization of the new Midvale Co., which will manufacture, as heretofore, forgings, alloy steel bars and billets, locomotive tires, industrial rings and other tire mill products. Stuart Hazelwood, who, as stated last week, has become vice-president in charge of sales, announces the appointment of Walter B. Smyth, former Midvale district sales manager in Cleveland, to the same position with the Midvale Co. Fred W. Sager, who was in the Chicago office of Midvale, becomes district sales manager there, with office in the McCormick Building. William J. Patterson, who represented Midvale on the Pacific Coast, will work in the same capacity for the Midvale Co., with office in the Monadnock Building, San Francisco. Herbert H. Moffitt, for the past two or three years in charge of the Midvale office in Washington, becomes district manager for the Midvale Co. there, with office in the Woodward Building. As announced last week, the New York sales office will be in charge of Ward A. Miller, former district sales manager of Midvale in Chicago.

L. B. Morris, who becomes manager of sales for Bethlehem Steel Co. on the Pacific Coast, would on April 19 have completed 30 years' service with the



L. B. MORRIS

Midvale Steel & Ordnance Co. and its predecessors. He obtained employment as an office boy with the old Cambria Iron Co. in 1893. At that time George V. Smith was sales agent for the company. In 1897, upon the death of Mr. Smith, Thomas F. Russell was appointed sales agent and Mr. Morris worked with him as his assistant. When Mr. Russell resigned in 1900 Mr. Morris was appointed general sales agent in New York, the Cambria Steel Co. up to that time having had three separate New York sales departments handling different products. Mr. Morris consolidated the offices at 71 Broadway. With the absorption of Cambria Steel Co. by the Midvale Steel & Ordnance Co., a number of years ago, Mr. Morris was appointed New York sales agent for the combined companies and continued in that capacity until the recent merger of Midvale Steel & Ordnance Co. with the Bethlehem Steel Co. Few, if any, men in the steel business have a wider acquaintance with the Eastern trade, and his popularity has given him a position of influence among steel buyers.

J. E. McLain, who has been named Pittsburgh dis-

trict sales manager of the Bethlehem Steel Co., and as such will head the combined Bethlehem Steel Co. and



J. E. McLain

Midvale Steel & Ordnance Co. offices in that city, has held that position, first for Cambria Steel Co. and later for Midvale Steel & Ordnance Co., for the past 12 years. He has been identified with the steel industry since 1897, when he entered the Pittsburgh sales office of the Cambria Steel Co. His father was Pittsburgh district sales manager at that time, and Mr. McLain succeeded him upon his retirement from active duties in 1911. He was born and has resided in Pittsburgh all his life, and was graduated from Princeton with the class of 1896.

Walter B. Smyth, who has been Cleveland district sales manager of the Midvale Steel & Ordnance Co. and Cambria Steel Co., has been appointed Cleveland sales manager of the new Midvale Co., which will operate the Midvale company's Nicetown plant which was not taken over by the Bethlehem Steel Co. The new Midvale Co. has taken over the Midvale-Cambria steel warehouse in Cleveland, handling high-speed and carbon tool steel and alloy steel, which continues under Mr. Smyth's charge. The remainder of the Midvale and Cambria sales organization in Cleveland has been merged with the Cleveland office of the Bethlehem Steel Co. under John C. Chandler, sales agent, and has moved to the Bethlehem offices in the Guardian Building. The Midvale Co. for the present will continue to occupy the former Midvale-Cambria offices in the Swetland Building.

M. Fillmore Day has been appointed district sales manager at Chicago for Rogers, Brown & Co. For 11 years, excepting two years in the army, Mr. Day was connected with Hickman, Williams & Co. Until early in 1917 he was located at St. Louis, then being transferred to the Philadelphia office. In August, 1917, he joined the country's armed forces, returning to the company at Pittsburgh in November, 1919. About a year ago, he started business for himself at Pittsburgh as a broker in pig iron and coke. He was born at Clarksville, Tenn., Jan. 24, 1893.

A. C. Crockett, Jones & Laughlin Steel Corporation, Pittsburgh, delivered an illustrated address, on the subject, "The Steel Market," at the monthly dinner meeting of the Purchasing Agents' Association of New York, held last Tuesday evening in the club rooms of the Builders' Exchange, 34 West Thirty-third Street.

Howard Talbot, who has been chief engineer of the Woodward plant, Mackintosh-Hemphill Co., Wooster, Ohio, has resigned that position to become assistant chief engineer with the United Engineering & Foundry Co., Pittsburgh. He has assumed his new duties.

A. A. Walker, sales engineer General Fireproofing Co., has been transferred from the home offices at Youngstown, Ohio, to the Boston district office, where he will take up branch agency work.

Thomas E. Williams, superintendent of the Empire plant at Niles, of the Youngstown Sheet & Tube Co., Youngstown, Ohio, has also been placed in charge of the Thomas sheet mill works, succeeding Harry H. Holloway, who resigned to become identified with the Apollo Steel Co., Apollo, Pa. Both plants belong to the company's Brier Hill division.

Dr. Edward P. Hyde has tendered his resignation as director of research of the National Lamp Works, General Electric Co., Cleveland, effective June 30. He plans to spend a year or more in France, where his work will be largely for the International Commission of Illumination, of which he is president.

Harry B. Joyce has been appointed manager of the synchronous motor department of the Ideal Electric & Mfg. Co., Mansfield, Ohio. He is a graduate of Cornell University, class of 1912, and was previously affiliated with the United Railway & Electric Co., Baltimore, handling tests and reconstruction. Later he was appointed power engineer for the United Electric Light & Power Co., New York.

M. M. Marcus has resigned as vice-president and general superintendent of the Rhode Island Malleable Iron Works to become associated with the Gulick-Henderson Co., 145 West Thirty-sixth Street, New York, engineers, metallurgists and chemists, as consulting engineer in charge of the foundry department. His entire time will be devoted to consultation in foundry engineering. He will also continue to serve on the committee of molding sand research and the sub-committee on conservation and reclamation of molding and core sand of the National Research Council.

W. J. Priestley has resigned as works manager, Pittsburgh Crucible Steel Co., Midland, Pa., to become associated in a metallurgical capacity with the Electro-Metallurgical Sales Corporation with headquarters in Pittsburgh. Mr. Priestley, before going with the Pittsburgh Crucible Steel Co., was steel superintendent at the Naval Ordnance plant, Charleston, W. Va., and prior to that was with the Bethlehem Steel Co., at South Bethlehem. He was graduated from Lehigh with the class of 1908. His successor at Midland is R. M. Keeney, who has been general superintendent, Central Iron & Steel Co., Harrisburg, Pa.

John F. Hazen, assistant general manager of sales, Pittsburgh Steel Co., has been promoted to the position of general manager of sales, succeeding the late



JOHN F. HAZEN

Joseph G. Deericks. Mr. Hazen has been identified with the iron and steel business since 1897, when he entered the Cincinnati office of Rogers, Brown & Co., and later represented the Old Riverside Iron Works, Wheeling, W. Va. In September, 1899, when the Riverside Iron Works was absorbed by the National Tube Co., Mr. Hazen went back with Rogers, Brown & Co. in their Chicago office and after a year's service there was transferred to the New York office. In 1901 he joined the sales force in the New York office of the American Sheet Steel Co. The following year he became associated with the Pittsburgh Steel Co. as a traveling salesman and in 1903 was assigned to the general offices in Pittsburgh and placed in charge of sales to jobbers and manufacturers under Fred H. Forman, then general manager of sales of the company. Mr. Hazen was appointed assistant general manager of sales Feb. 25, 1922. He was born in Cincinnati April 27, 1878. George H. Jones, since June 1, 1919, Chicago district manager of the company, has been named assistant general manager of sales, to fill the vacancy caused by the promotion of Mr. Hazen. Mr. Jones has been identified with the Pittsburgh Steel Co. since the latter part of 1908. Before assuming charge of the Chicago office, he had been assistant manager of the New York office for five years. During that period, he had charge of an office which the company maintained in Washington in the war period.

John B. Warren has been re-elected president of the Penn Seaboard Steel Corporation, Philadelphia. W. P. Barba was re-elected chairman of the board of directors, and C. F. Jemison was elected vice-president to succeed George Satterthwaite, who recently resigned. Mr. Jemison will also retain the position of treasurer. M. S. Hager becomes secretary and assistant treasurer.

C. A. Burkhalter, formerly in the special agents department of the American Sheet & Tin Plate Co., Pittsburgh, has been appointed to succeed F. G. Crumley, special agent, Wheeling Steel Corporation, with headquarters at the Portsmouth, Ohio, works, who recently resigned.

George D. Blair, president Elliott-Blair Steel Co., recently sold out his interest in the company and will sever his connection with it on April 30. He was born to the steel industry.

His father was Thomas Shoenberger Blair, one of the original partners in Shoenberger & Co. and Shoenberger, Blair & Co., Pittsburgh, plant of which now is known as the Shoenberger works of the American Steel & Wire Co. Mr. Blair was born in Pittsburgh and there spent his early business life. He became affiliated with the Elliott-Blair Steel Co. in 1898, as president. George D. Blair, Jr., assistant secretary and treasurer of the company, leaves it with his father. Their future plans are not definite at this time.



GEORGE D. BLAIR

Howard C. Matlack, president Matlack Coal & Iron Co., Inc., with general offices at 44 Beaver Street, New York, has been elected secretary-treasurer, and also a director of the Emporium Iron Co., Emporium, Pa.

J. D. Fleming, formerly a vice-president of Lalance & Grosjean Mfg. Co., New York, has recently become identified in a special capacity with the sales department of the Baltimore Tube Co., Inc., Baltimore, Md.

Frank C. Lewis, who has been connected with the Colonial Steel Co. and the Crucible Steel Co. of America for many years, has been appointed secretary and treasurer of the Steel Fence Post Manufacturers Association, with offices in the Crilly Building, 35 South Dearborn Street, Chicago.

Wesley J. Beck, director of research American Rolling Mill Co., Middletown, Ohio; Harry Y. Carson, research engineer, cast iron pipe, Birmingham, Ala.; E. E. Chapman, engineer Atchison, Topeka & Santa Fe Railroad, Topeka, Kan.; J. B. Daily, metallurgist General Motors Corporation, Dearborn, Mich.; Charles R. Hook, vice-president American Rolling Mill Co., Middletown, Ohio; Kenneth V. King, metallurgist, Richmond, Cal.; William A. Mudge, physical metallurgist International Nickel Co., Huntington, W. Va.; John H. Nelson, research engineer and metallurgist, Wyman-Gordon Co., Worcester, Mass.; Charles Le P. Terry, technical assistant and chemist to by-products works, Wilson, Pa.; Enrique Touceda, consulting metallurgical engineer, Albany, N. Y. The above appear on the list of candidates for membership to be voted on at the annual meeting of the Iron and Steel Institute at London, May 10 and 11.

Paul V. Harper, secretary St. Louis Coke & Chemical Co., St. Louis, has been made vice-president of the company and will be located at the St. Louis office.

E. P. Everhard, mill engineer for the last six years with the Wierton Steel Co., Wierton, W. Va., has been appointed assistant to vice-president of Freyn, Brasert & Co., engineers, Chicago. Previous to his connection at Wierton, he was with the Canton Sheet Steel Co., Timken Roller Bearing Co. and the Central Steel Co.

B. A. Tozzer, Cleveland sales agent of the Niles Tool Works and the Pratt & Whitney Co., will address the Toledo, Ohio, section of the American Society of Mechanical Engineers May 3, on "Rambles in the Orient."

He will show numerous lantern slides taken during a recent trip in the Far East.

Richard F. Grant, vice-president M. A. Hanna Co., Cleveland, has been elected president of the Cleveland Chamber of Commerce for the ensuing year. He was first vice-president during the past year. Edward S. Jordan, president Jordan Motor Co., has been elected second vice-president. Newly elected directors include B. F. Bourne, chairman of the board Bourne-Fuller Co.; George E. Merryweather, president Motch & Merryweather Co., machinery dealer; Thomas P. Robbins, vice-president and treasurer Cleveland Hardware Co., and H. A. Rock, vice-president, Van Dorn Iron Works Co.

Guy Weir, who has been superintendent of the blast furnaces of the Pittsburgh Crucible Steel Co., Midland, Pa., has resigned to become blast furnace superintendent of the Otis Steel Co., Cleveland, succeeding S. R. Greene, who has resigned.

William Breeden has resigned the sales manager-ship of the Iroquois Steel Co., Buffalo. He was formerly in charge of sales of the Lackawanna Steel Co., before it was acquired by the Bethlehem Steel Co.

George A. Morrissey, general superintendent St. Louis Coke & Chemical Co., Granite City, Ill., announces the appointment of M. D. Curran as assistant general superintendent, and E. L. Clair as superintendent of blast furnaces. Mr. Curran formerly was assistant general superintendent, and Mr. Clair superintendent of blast furnaces of the Toledo Furnace Co., Toledo, Ohio.

N. C. Failor, who for the past few months has been New York district representative of Alfred Box & Co., Philadelphia, cranes, has severed this connection to engage in business for himself, dealing in new and used punching and shearing machinery, bending rolls, engine lathes, etc. He was at one time manager of the machinery department with the Canadian Fairbanks-Morse Co., Montreal, and was later engaged in the used machinery business in the Failor-Martin Corporation, New York. He was also at one time on the sales force of the Niles-Bement-Pond Co.

Rex C. Wilson has severed his connection with the Coatesville Boiler Works, Coatesville, Pa., as designing engineer to assume like duties with the Downingtown Iron Works, Downingtown, Pa.

S. M. Tomlinson, partner in Frank Samuel & Co., dealers in ferroalloys, scrap, etc., Harrison Building, Philadelphia, returned this week from Rio de Janeiro, having been away about six weeks.

E. L. Essley, president E. L. Essley Machinery Co., Chicago, machine tool dealer, has returned to his desk after spending the winter in California and Hawaii.

All steel mills in the Cincinnati district continue to operate to capacity. The American Rolling Mill Co., Middletown, is reported to have broken all production records in March. The Portsmouth works of the Wheeling Steel Corporation is running to capacity, and the new wire and nail mill is partly in operation, though the new rod mill is not yet completed. Full operations are expected to be secured about May 1. The Andrews Steel Co. and the Newport Rolling Mill Co. are both running at capacity. It is expected that the recently announced wage advances will be effective in all these plants April 16. There is a shortage of common labor at steel works, and with the approach of the warmer weather this situation is expected to become more acute. Skilled men of the maintenance forces are also leaving the mills to secure outside employment, more particularly in the building trades.

A new design of staybolt tap has been put on the market by W. L. Brubaker & Brothers Co., Millersburg, Pa. It has five helical type flutes.

OBITUARY

CHARLES PRESTON BURGESS, manager Pacific Coast Steel Co., San Francisco, died in that city of heart failure, on April 14. He was formerly general superintendent of the Western plants of the Republic Iron & Steel Co., with headquarters at Chicago, and in 1914 went to the St. Louis Screw Co. as general manager, subsequently becoming identified with the Pacific Coast Steel Co. He was about 48 years of age.

JAMES SMITH, vice-president and general manager New Process Castings Co., Pittsburgh, died suddenly in his home, Dormont, Pa., on April 12. He was born in Glasgow, Scotland, 59 years ago, and was associated with the Hyde Park Locomotive Works there for several years. For the past 17 years he had been actively engaged in foundry work in Pittsburgh and Chicago.

FREDERICK M. STEVENS, production manager of John Chatillon & Sons, died in New York on April 8, in his 72d year. He was born in Danbury, Conn., and after finishing public school attended Gloversville Military Academy. He then entered Cornell University, where he studied mechanical engineering with the class of '74. After graduation he spent 14 years in production work with Mathews & Willard, Waterbury, Conn., which he left to take charge of production for the Manhattan Screw & Stamping Co., in New York. During the last 12 years of his life Mr. Stevens was production manager of John Chatillon & Sons, developing and improving many types of scales and cutlery.

C. F. GRAINGER, president Grainger & Co., Louisville, Ky., and formerly mayor of Louisville, died on April 13 at his home, 1132 South Third Street, that city. He was born in 1854 in Louisville. William Grainger, proprietor of the Phoenix Foundry, which later became Grainger & Co., was his father, and had Mr. Grainger lived until next December, the company would have completed a century under the direction of father and son. His education was in the public schools of his native city and upon graduation he worked as a molder in his father's foundry. Later he tried his fortunes in various other crafts in Chicago, but eventually returned to his father's business. After mastering the problems of foundry work, he became president of the Grainger company at his father's death. Mr. Grainger was active in Louisville city government for many years and was elected mayor in 1901.

P. J. BROWN, president P. J. Brown Construction Co., Cleveland, died at St. Vincent's Hospital, Jacksonville, Fla., on April 3. Mr. Brown had been spending the winter at Miami and contracted influenza. In 1907 he organized the P. J. Brown company, specializing in fire brick construction on blast furnaces and steel plants. He had been president of the company since its inception.

JOHN T. BURKE, assistant to the master mechanic at the South Works, Illinois Steel Co., South Chicago, Ill., died on April 8.

GEORGE DWIGHT WOODBURY, president Wollaston Foundry Co., Wollaston, Quincy, Mass., died in that city on April 15. Mr. Woodbury was 79 years old and succeeded A. A. Lincoln as president of the foundry.

As a part of the expansion program of the Canadian Ford Motor Co., contracts for the new docks to be 1000 ft. long have been awarded to the Considine-Reid Construction Co., Toronto. The estimated cost is \$750,000.

Struthers furnace, a merchant stack, was blown out Monday, April 16, for relining and will be idle until May 15. Its suspension reduces the number of active furnaces in the Youngstown district to 41 of 46.

NEW TRADE PUBLICATIONS

Machinists Tools.—Brown & Sharpe Mfg. Co., Providence. Booklet of 15 pages supplementing catalog No. 25 and listing tools more recently brought.

Woodworking Machinery.—Oliver Machinery Co., Grand Rapids, Mich. Bulletin No. 7, 15 pages, outlines and illustrates the salient features of portable machines, including saw benches, band saws, jointers, sanders, wood trimmers, tool grinders, vises and glue heaters.

Portable Timing Device.—General Electric Co., Schenectady, N. Y. Bulletin No. 46053, four pages. Describes a device which may be used with graphic instruments, in measurements of angular velocities and for indicating a definite time-interval ranging from 1 sec. to any whole number of minutes. Accuracy of 0.1 in 60 sec. is said to be attained. The device consists of an encased clock to be used with a standardized clock as a means of secondary timing to supplant the stop watch. Details of the instrument and its applications are given.

Electrical Motors.—Louis Allis Co., Milwaukee. Bulletin 8½ x 11 in., 12 pages. Devoted to the Watson multi-speed motor, which is described as a motor operating on polyphase alternating current circuits with approximately the close control or varying speeds afforded by direct current motors having adjustable speed through field control. Outstanding features are given and its application to various types of machinery attractively illustrated.

Factory Buildings.—Austin Co., Cleveland. Booklet of eight pages devoted to a comparison of the relative advantages and disadvantages, comparative construction and operating costs of multi-story and single story buildings. Several charts and graphs are included in the illustrations.

Bristol Recording Gages.—Bristol Co., Waterbury, Conn. Catalog No. 1006, 84 pages, 8½ x 11 in. This covers with some completeness recording gages for both pressure and vacuum, running from full vacuum to a pressure of 12,000 lb. per sq. in., the gages being adaptable to practically every application where pressure of liquids, gases, steam or air have to be measured. Long distance transmitting systems are given special attention. The illustrations are numerous, covering not only instruments made for a wide variety of uses but also specimens of charts showing different scales for different purposes. Several hundred of these scales are illustrated as an aid in ordering.

Mellin Belt Conveyor Idler.—Chillingworth Engineering Corporation, New York. In a 4-page folder 8½ x 11 in., is described a form of troughing idler constructed of steel and consisting of three cold drawn pulleys of equal length with bearings mounted in self-aligning bearing boxes. The object of this idler is to form a perfect trough for a flexible leather or rubber belt and thus permit the carrying of granular substances without spilling. Special lubricating arrangements are made for long continued use.

Production Tools.—Scully-Jones & Co., Chicago. A 40-page illustrated pamphlet, 3¼ x 6¼ in., describing the "wear-ever" line of production tools, including tap, drill and reamer chucks, cutter chucks, extension sockets, keyway cutters, slot cutters, flute end mills and other tools.

Speed Reducers.—W. A. Jones Foundry & Machine Co., Chicago. Catalog No. 26, 96 pages, 8½ x 11 in., profusely illustrated. Describes construction and operation of "Jones" spur gear speed reducers and includes illustrations of actual installations.

Scrap Metal Presses.—Logemann Brothers Co., Milwaukee, four-page folder describing and illustrating the company's line of hydraulic presses and balers.

Minimizing Fuel Losses.—Uehling Instrument Co., Paterson, N. J. A 12-page folder describing apparatus for fuel control through increasing the percentage of CO₂ in the waste gases. Instruments are illustrated and data given showing how savings may be effected.

Foundry Equipment.—Link-Belt Co., Chicago. Instructional book on "Material Handling Equipment for Foundries," devoted to the application of Link-Belt products to the modern foundry. It is profusely illus-

trated with photographs of actual installations and also line and wash drawings. It tells, in print and picture, of the practices and methods of six large and nationally known foundries. It is known as book No. 690.

American Air-Tight Doors.—Conveyors Corporation of America, Chicago. Four-page leaflet featuring doors for ash pits, boiler settings, coke, core and bake ovens, oil stills, dryers, retorts and kilns. The door has a ventilated cast iron liner and is shown attached to its frame with a carefully machined bearing surface between the two.

Solar Heat Generators.—American Foundry & Furnace Co., Bloomington, Ill. 24-page loose-leaf catalog, 11 x 8½ in., devoted to several subjects, including the so-called Solar heat generators, sectional heat generators, "Asbesto-Steel" casings for heat generators and sanitary and toilet arrangements for schools, public buildings and factories. The various items covered are illustrated and specifications are given as to materials, sizes, etc.

Combination Machine Tool.—Triplex Machine Tool Corporation, 50 Church Street, New York. Pamphlet describing the company's combination machine for turning, milling and drilling, bench style and with floor stand.

Gears.—Boston Gear Works, Norfolk Downs, Quincy, Mass. Catalog No. 42. Size 3¼ x 6 in., 192 pages. Sizes, dimensions, list prices and illustrations are given of a large variety of gears of various materials. Bushings, pillow blocks, hangars, sprockets and steel chains, universal joints, ball-bearings, and worm gear reduction units are also included. A section is devoted to the application, dimensions and other details of the standardized Renold-Boston silent chain drives.

Factory Dust Collector.—J. W. Paxson Co., Philadelphia. Eight-page folder devoted to a collector for dust, to be placed on the roof of a factory building and to absorb the dust from a great variety of industrial processes. It operates on the principle of baffles and is designed to remove from the air 98 per cent of the fine powder and dust which floats in it, thus removing a source of injury to the workman and of danger to plant equipment. It works entirely on the dry principle.

High-Pressure Boilers.—Whittlessey Engineering Co., Cleveland. Six-page loose-leaf sheets covering a boiler for high pressure for either steam or water and with a superheater for the steam boiler. The point is made that a high pressure can be obtained with little more fuel than a low pressure and with results out of all proportion to the added expenditure for fuel. The superheating marine boiler illustrated is made in all sizes for 200 to 600 lb. per sq. in. working pressure, thus using the higher potential energy of the steam.

Oswego Internally Fired Water-Tube Boilers.—A. D. Granger Co., New York. Twenty-page booklet 8 x 10½ in. devoted to a boiler for heating buildings, in which the furnace is inclosed within the shell of the boiler. There is a complete water jacket around the fire between the inner and outer shells of the boiler, so that structurally it partakes somewhat of the nature of a locomotive boiler, but differs from the latter in that the hot gases of combustion pass around the tubes instead of through them. Tables are given of the various sizes and dimensions of boilers for different capacities.

The use of steam turbines for driving heavy machinery exposed to carbon dust and grit is advocated in a four-page pamphlet recently issued by the DeLaval Steam Turbine Co., Trenton, N. J. The company's equipment as employed in the by-product coke oven plant of the New England Fuel Transportation Co., Everett, Mass., is described and illustrated. Two steam turbines are used for driving direct current generators and for operating swing-hammer coal crushers. Centrifugal oil purifiers are also used.

The Westinghouse Electric & Mfg. Co., has issued the following leaflets: No. 1161-A, describing large squirrel cage induction motors, type CS; No. 3400 on type F-10 oil circuit breakers; No. 1161 on type AF automatic auto-starters for polyphase squirrel cage induction motors; No. 1765 on motors for Westinghouse-Baldwin mine locomotives (900 series); No. 2390-A on type E engine-driven alternating current generators and No. 3499-A on type CS control switches.

Performance of High-Speed Cutting Tools

(Continued from page 1103)

cobalt steel and a cast tungsten-chromium-vanadium steel; the compositions are given below:

Steel C.	Si.	Mn.	W.	Cr.	V.	Co.	Mo.	Ni.
A	0.60	0.21	0.25	15.57	3.27	0.49	None	None
B	0.65	0.48	0.55	None	4.62	0.68	4.73	4.72
C	1.64	0.59	0.15	None	10.56	0.05	3.17	0.21
D	0.93	0.27	...	15.51	2.98	0.83	...	...

The rolled high-speed steel was used in the condition as received, that is, the tools were cut from the bar without intermediate forging; the Co-Cr-Mo alloy was used in the form of blanks well forged in all directions; the other two compositions were cast to form, requiring

Table 1—Performance of Milling Cutters

Cutter Steel No.	Heat Treatment Deg. Fahr.	Relative Performance			
		First Grind	Second Grind	Each Treatment	Each Steel
1	Preheat 1500 to 2250 Q. Oil draw 700, air cool.	57.9	70.6		
A 2	Preheat 1500 to 2250; cool in air blast; no draw.	66.3	34.9	62.8	
4		62.8	90.0	63.5	63.2
1	Preheat 1500 - 2010; cool in air blast; draw 900, air cool.	62.0	26.8		
B 2	Same except 400 deg. draw.	78.5	23.0	47.6	
3		28.0	100.0		
4		72.4	55.6	64.2	55.9
1	1850 deg. fce. cool, reheat 1820; air cool to 1000; Q. oil; drawn 900; air cool.	14.9	38.1		
2		24.7	6.3		
3		66.7	15.4		
4		46.8	7.9	27.6	
C 5	1850; air cool to 1000; Q. oil at 450 (20 min.) air cool.	36.0	5.2		
6		21.4	19.6	20.6	25.3
D 1	Unknown	3.2	11.6	7.4	7.4

*Run in groove in which previous cutter broke. Not used in averages.

only slight grinding before use. The heat treatments applied and the results obtained are given in Table 1. The method of test employed for these tools was to cut 25 linear feet in a selected uniform steel block of the required characteristics, using a 0.10-in. depth of cut, at a feed and speed commonly used for high-speed steel cutters of this type; then the feed and speed were increased during a second run with 0.10-in. depth of cut and a total length of 25 ft. This increase in feed and

would have indicated the latter to be of no value whatever.

Any attempt to record relative performance on a percentage basis in a test of this character is open to many objections, but most all that have been suggested and used place the tools in the respective lists of superiority in the same order; that tool which had the longest life heads the list, and so on. In this test a merit value was obtained for each run, as the product of feed and actual speed for that run provided the full 25-ft. length was completed; the cutting of only part of the 25 ft. was assigned a fraction of this value in direct proportion to the length cut. The summation of the merit values for the various runs formed the basis of computation of relative performance.

In another series of tests not yet completed (so that information as to composition of the tools is not available) an effort has been made to compare cast tungsten-chromium-vanadium steel tools with those of similar composition, cut from rolled bars. The method of testing and manner of computing the relative performance were similar to those used in the previous group of tests; the data relative to heat treatment and cutting properties are given in Table 2.

Although it is realized that the methods of test, manner of rating tools, heat treatment of tools and probably other factors, are open to serious criticisms, still a number of valuable facts can be obtained from a review of this work. Among them the following are noteworthy:

(a) Cast Co-Cr steel tools containing high proportions of carbon are subject to breakage in cutting medium hard steel, particularly if the cutting conditions are severe. For the conditions used in this test, their performance rating is very low. For the cutting of soft metals at high speed where the maintenance of a razor-like edge is a desirable condition, these tools may find wide application; in their favor are their high carbon content and great hardness. In intricate forms their low hardening temperature is a distinct advantage. The structure of these tools in the hardened state is showed in Fig. 8.

(b) Tool D-1 (Table 1) gave unusually poor results, probably because of the soft spots in this cutter; it is presumed that the heat treatment was non-uniform as a variation of

Table 2—Performance of Milling Cutters

Material	Heat Treatment Deg. Fahr.	Performance of 2 1/2 in. x 2 1/2 in. Slab Mills			Performance of 5/8 in. x 3 1/2 in. Straddle Mills		
		First Grind	Second Grind	Average	First Grind	Second Grind	Average
H. S. Bar Steel	Preheat 1500 to 2250; Q. oil; draw 550; air cool.	100.0	82.7	91.4	100.0	87.5	93.8
Cast H. S. Steel	Preheat 1500 to 2250; Q. lead at 1100; draw 1230; air cool.	58.5	50.3	54.4	46.5	77.8	62.2
Cast H. S. Steel	1830 fce. cool; reheat 1830; fce. cool to 1780; air cool to 1000; Q. oil.	51.2	56.8	54.0	55.6	42.4	49.0

speed was continued in the above manner until failure occurred; the range of speed was from 110 to 260 ft. per min. and the feed increased from 7 to 16 in. per min.

After breakdown the cutters were re-ground and re-tested. In order to observe not only the behavior after regrinding as it is usually understood, but also to note the depth of hardening (insofar as this is related to cutting qualities) the regrinding was so performed as to remove 0.125 in. from the diameter of the cutters and 0.010 in. from the thickness. It will be noted that this is an extremely lengthy test, and therefore approaches closer to operating conditions than most cutting tests, in particular many of the lathe tests previously described. At the same time the high speeds and feeds, ultimately used to produce breakdown, are decidedly not production conditions, although frequently used for testing. In the present instance, the extremely rapid methods of testing sometimes employed, judging from the breakages obtained in some of the cast tools,

418 to 652 Binell was encountered. This is therefore not a fair test of the material.

(c) Forged Co.-Mo.-Cr. steel shows a performance rating closely approaching that of forged W.-Cr.-V. steel (about 89 per cent). However, the results are erratic and often poor after re-grinding, hence when tungsten prices are low there would be no advantage in the adoption of this alloy. It is worthy of note, however, that the best showing in the second group of tests was made by one of these cutters. Also, as indicating the peculiar adaptability of some cutting alloys, in the lathe tests previously referred to, tools made from this same bar had a performance rating of only 53 per cent as compared with that of tungsten steel of composition similar to that of the milling cutters used here.

(d) Cast tools of high-speed steel (Table 2) under the conditions employed were only

52 per cent to 66 per cent as efficient as tools cut from rolled bars of similar composition. Regrinding does not reduce their cutting ability but, strangely enough, great variations in heat treatment produced little change in the results obtained in these tests. This may perhaps be explained by Figs. 1 and 2, from which it will be observed that the microstructure of tool D-1 (Table 1) is modified by annealing only insofar as the matrix is concerned; the dendritic carbide network is unaffected. Unfortunately these tests have not at this time proceeded far enough to give similar data for the steels of Table 2. It is most probable that solution of the major part of this network would greatly increase the performance of these tools. Nevertheless, where intricate tool form and moderate cutting conditions prevail it is believed that tools in the conditions used here deserve serious consideration; lack of necessity for very high quenching heats for development of maximum cutting qualities would be in their favor.

In actual shop operation, however, quality of individual tools plays an important part. Cutting properties of any brand or composition type are meaningless in the face of failures caused by poor melting or fabricating practice or improper treatment on the part of the user.

The accompanying photomicrographs are typical of the conditions that are sometimes found. Fig. 3 illustrates the structure of a milling cutter that chipped badly when cutting nickel steel. This cutter had evidently been machined directly from the bar without forging, as there is no distortion of the carbide strings which in this specimen are unusually pronounced. The streaks were very numerous and parallel to the axis of the cutter (and therefore to the cutting edge) thus

being great sources of weakness. The white band in which these hard particles are embedded appears to be austenite, resulting from increased carbon concentration in the vicinity of the carbides.

Fig. 4 is the microstructure at the center of a heavy lathe tool broken in service; in addition to isolated carbide particles, masses of the carbide eutectic similar to that found in cast high-speed steel (Figs. 1 and 2) are clearly shown; this tool was overheated, probably in heating for hardening, its temperature having reached that of the mushy state. Such conditions will always be found on the surface of hardened tools that have been hot enough to blister, but its occurrence well below the surface, as in this instance, is a sign of overheating and of brittleness.

Fig. 5 shows the condition of a square nose lathe finishing tool that has not been heated for quenching high enough to develop the characteristic martensitic structure (with original austenite grain boundaries) of a well hardened high-speed steel. The tool probably broke, due to sudden dulling of its edge with the consequent heavy pressure; in this case high carbon content of the metal (0.86 per cent) was a contributing cause.

Occasionally tools are found of normal composition and structurally in the best condition for their purpose, but which fail, due to stresses set up by forging to shape at too low temperatures and not removed by annealing prior to hardening. The microstructure of such a failure is shown in Fig. 6. And frequently, in addition to carbide streaks and in combination with them, are found relatively large particles of slag and sulphides such as have so frequently caused difficulties in other quality steels. One such case of slag and carbides is shown in Fig. 7; the steel in this instance has not been etched. Needless to say, in steels of this class, particularly for very heavy duty, non-metallic inclusions must not exist except as the most minute and widely distributed particles.

TO ATTRACT LABOR

Radio Being Used to Increase Number of Workers—Shortage in Pennsylvania

HARRISBURG, PA., April 16.—The radio is being put to practical use in Pennsylvania to attract labor to the State, according to reports received here by Robert J. Peters, director of the employment bureau of the State Department of Labor and Industry. The iron and steel trade of the State especially is unable to obtain sufficient workers, skilled and unskilled, so plant officials are trusting that the situation might be somewhat alleviated by broadcasting needs of State plants.

The State Employment Bureau recently accepted the offer of the KDKA station in Pittsburgh to broadcast openings for workers in the western part of the State. The test was so successful that a definite place in the program each Monday and Friday evening is to be given to the Employment Bureau, and will be broadcast from KDKA.

Inability to obtain a sufficient supply of workmen, both skilled and unskilled, is interfering with the operation of a number of iron and steel plants throughout Pennsylvania, according to the semi-monthly report for the last half of March to Dr. Royal Meeker, commissioner of the Pennsylvania Department of Labor and Industry. Virtually all employment offices of the State are reporting needs on the part of various firms for workmen.

Philadelphia reports that the shortage of molders for gray iron, steel and malleable plants is becoming more pronounced every week. Automobile body makers need skilled mechanics and men to learn the various machine operations.

In Erie wages in all lines are being gradually raised, but a demand still exists for skilled men. The situation has been somewhat alleviated by the return of men from the larger centers because of more suitable housing conditions in and near the city.

Harrisburg finds activities in a number of plants handicapped by the inability to get sufficient men.

Johnstown industries are operating virtually at capacity, but a marked shortage of common labor is noted. McKeesport reports its mills operating at capacity when they are able to obtain full quotas of men.

In the Pittsburgh district the demand for labor in steel making plants is the heaviest it has been for some time. Skilled men along some lines are especially scarce.

Every foundry in Reading is reported open for molders. Early settlement of the shopmen's strike on the Central Railroad of New Jersey promises to benefit the iron and steel industry in and about Scranton.

Carburization of Steel

An investigation of the effect of the quality of steel upon its carburizing properties, and particularly its hardening properties after carburization, was suggested to the Bureau of Standards by commercial metallurgists as a problem of very considerable commercial importance. In order to obtain a wider expression of opinion on this matter, a circular letter was sent to approximately 100 prominent metallurgists. The replies which have been received all indicate the desirability of carrying out such an investigation and the practical importance which the results would have. As soon as the necessary material (abnormal steels) can be obtained, the work will be started.

Tests of Welded Rail Joints

Two welded 7-in. rail joints were recently tested by the Bureau of Standards for the welded rail joint committee of the American Electric Railway Association and the American Bureau of Welding. One of the joints, a thermit weld, failed at an ultimate load of 600,000 lb. The other joint, of the welded fishplate type, failed at about 200,000 lb. Transverse tests were also made on similar welds. These tests illustrate the methods which will be used in testing several hundred joints representing types now used in this country.

Plans of New Companies

The Standard Spring & Axle Co., Inc., 2816 Main Street, Dallas, Texas, has been incorporated with capital stock of \$30,000, and will manufacture springs, axles and bearings. It is now building a plant and installing machinery. Work on a production basis will be started within a few weeks. L. K. Weaver is president and treasurer; T. P. Steger, vice-president, and J. W. Hall, secretary.

Copeland Products, Inc., has been organized as a Delaware corporation for manufacturing household refrigerating units, with factories in Flint, Mich. Capitalization consists of 200,000 shares of no par value stock, 100,000 shares of which have been subscribed by Flint and Detroit people. The exact location of the plant has not been decided upon. Development work in connection with production has been in progress for a year, the work having been done by the Electricold Corporation, which the new company succeeds. Work will commence during the summer on the new building, but for the time being a plant will be leased and necessary equipment installed. The bulk of machine work will be done through contract, bids for which are now being received. E. J. Copeland, president of the company, was for several years with the Buick Motor Co. and was largely responsible for the development of the Kelvinator Corporation.

The Stewart Stationery Vending Machine Co., 817 Detwiler Building, Los Angeles, Calif., has been incorporated under California laws with capital stock of \$100,000 and will manufacture vending machines. These will be built by contract, which the company expects to place in Chicago, since it will be made one of the distributing points. Owing to the work of organizing the office staff and other details, the matter of contracts will not be taken up for about six weeks. Frank T. Taylor is president and general manager.

The Harrisburg Besser Concrete Block Co. care of E. M. Hershey, Bergner Building, Harrisburg, Pa., has been incorporated to manufacture concrete blocks. It has taken over a business which has been in operation for several years. Equipment has been purchased sufficient for present needs.

The National Standard Horseshoe Co., Inc., Akron, Ohio, has been incorporated to manufacture steel drop forged horseshoes and horseshoe pitchers' equipment. Part of its work is being done under contract and the remainder is done at the company's fully equipped plant. The officers of the company are Austin Stair, president; G. W. May, vice-president and treasurer, and A. L. Headlough, secretary.

The M & K Auto Products Corporation, recently organized as successors to the McDonald-Klein Co., has been incorporated with capital stock of \$30,000 and will continue in the manufacture of M & K water pumps for automotive use. The company has moved into its new factory and offices at 74 East Jewett Avenue. In the near future the company expects to add several other accessories to its line. In the new quarters the company has production facilities ample for all requirements.

The Turbax Corporation, 54 West Twenty-first Street, New York, recently incorporated with a capital stock of \$75,000, is engaged in manufacturing and distributing laundry equipment and appliances, particularly a special design of washing machine, which for the present will be made by the Phillips Machine Co., West Somerville, Mass. Edwin Cowles, Cleveland, is president; C. O. Ward, vice-president and treasurer, and R. E. Taylor, secretary.

W. Parsons Todd, Inc., 52 Broadway, New York, which was recently incorporated with capital stock of \$100,000, to manufacture metal products, will devote its present activities to the sale of mining products. W. Parsons Todd, who heads the company, has been connected for several years with the sales department of large mining interests. His present connections are with the Quincy Mining Co. and the Butte Copper Mining Co.

The Universal Electric Stage Lighting Co., 321 West Fiftieth Street, New York, has been incorporated with capital stock of \$400,000 and is engaged in manufacturing lighting equipment and appliances. It takes over a business which has been established for about 25 years in making electric stage lighting devices. The company occupies a four-story building which will later be increased to six stories. It uses large quantities of sheets, aluminum alloy castings, also steel, brass and bronze castings. The incorporators are J. H., A. T., and L. Klegel.

The Eastern States Blast Furnace and Coke Oven Association will hold its next meeting at Bethlehem, Pa., on May 24. This will give those in attendance an opportunity to leave that evening for New York where the meeting of the American Iron and Steel Institute will be held May 25.

The Automobile Concessionaires, 200 West Fifty-ninth Street, New York, has been incorporated with a capital stock of \$50,000 to deal in automotive products. It will act as representative in the metropolitan district for the Crane Simplex Co. L. R. Best is president; J. V. Best, vice-president, and F. W. Falkner, secretary-treasurer.

The Amsco Products Co., New York, recently incorporated with a capital stock of \$100,000 to manufacture wireless instruments and equipment, is taking over an established business at 261 Broadway, and will extend its line to include complete radio sets. It now has a plant of limited capacity at 114 Fulton Street. Headquarters will be moved to the Fairbanks Building next month. Benjamin Price, care of Price Brothers, 261 Broadway, heads the company.

The Heidenkamp Plate Glass Corporation has been incorporated under Delaware laws with capital stock of \$3,000,000, to manufacture plate glass. Purchase of the plant at Springdale, Pa., of the Heidenkamp Plate Glass Co. has already been effected, and within six months, it is understood, the present capacity will be increased by 50 per cent. The officers are: Warren Hires Turner, president; Frank E. Troutman, vice-president and general manager; Joseph Heidenkamp, Jr., secretary, and John E. Allen, treasurer.

The Harlem & Bergen Tunnel Corporation has filed application at Albany, N. Y., for incorporation to construct one or more tunnels for vehicular and pedestrian traffic between Harlem and Bergen County, N. J. Senator O'Brien of New York, who introduced the bill to secure a permit, said that the enterprise is being backed by the Interstate & Intercity Tunnel Co., which has headquarters at the Hotel Theresa, Seventh Avenue and 125th Street, New York. The incorporators are Dr. M. C. O'Brien, New York; Comfort A. Adams, Cambridge, Mass., and Jacob W. Binder, Hackensack, N. J.

Davis Electrical Co., 28 North Main Street, Wilkes-Barre, Pa., has been organized as successor to Davis & Foster, who have been doing a general electrical contracting business. No manufacturing is being considered and business will be conducted generally along the same lines. Gomer R. Davis and Frank Foster, Jr., are the principals. The company will carry a line of electrical labor-saving devices.

The Weldaware Products Co., Erie, Pa., has been organized to manufacture aluminum kitchenware and kindred aluminum articles. It has acquired a plant which is now being fitted up for work and will be ready for production within a week. All manufacturing will be done in its own plant, which is sufficiently well equipped for present requirements. John R. Metcalf is treasurer.

Schulz & Ingram, Inc., electrical engineers, 31 Broadway, New Haven, Conn., has been organized to specialize in maintenance and electrical repairs of equipment used in industrial plants. It is also expected to manufacture special equipment as may not be found on the market. Plans are not yet entirely worked out. O. H. Schulz is president.

The partnership of Grace, Hunter & Michell has been organized in Cleveland to act as a selling agency for sheets, strip steel, brass and copper tubing and tool steel. The firm, which is located at 428 Bulkley Building, is composed of Frank H. Grace, formerly vice-president and sales manager of the Warner G. Smith Co., Cleveland; Frank A. Michell, formerly production manager of the Lakewood Engineering Co., and Daniel S. Hunter, national secretary of the Steel Barrel and Fire Extinguisher Associations, the latter not being actively engaged in the business. The firm will represent the Falcon Steel Co., the Wolverine Tube Co., the American Tube & Stamping Co. and the Lemoyne Steel Co.

The United States Shock Absorber Corporation, New York, has been incorporated with capital stock of \$300,000, and will manufacture shock absorbers and other automobile equipment. It is still in the formative stage. Plans are incomplete, but as a result of tests to which the shock absorbers were put, it is understood that the product is of exceptional merit, and it is likely that the company will be placed on a production basis as soon as possible. An incorporators' meeting will be held within a few days to decide upon the method of manufacture. The incorporators are: L. C. Reed, F. J. Feldman and V. O. Blair. Corporate representative is M. H. Weiss, 63 Park Row, New York.

The Refrigerating Construction Corporation, New York, has been incorporated with capital stock of \$100,000 and will manufacture refrigerating equipment and insulation products. It is planning either to lease or build somewhere in the vicinity of Manhattan. The company hopes to be able to go forth with the preliminary steps about May 1. The incorporators are: J. O. Delancey and R. E. Larsen. E. L. Brisach, 41 East Forty-second Street represents the company.

The Cloverleaf Milker Co., Urbana, Ind., was recently organized to manufacture milking machinery. Its immediate work will be done by contract, a commitment covering a

brief period having already been taken by an Ohio concern. Within a short time the company will let contracts for the manufacture of parts, preferably to a company located near Indianapolis or Chicago. Secretary E. F. Pretorius states that if the company is unable to obtain satisfaction by the contract method, it will build its own factory and install equipment during the current year.

The Aerobelle Co., Greendale Station, Worcester, Mass., has been organized to manufacture automobile accessories. Present operation has been covered by contracts for finished parts and the company will do the assembling. Next fall it will be open for negotiations with three steel stamping concerns for the manufacture and assembling of shock absorbers. It is looking for one company in the East, one in the West and one in Canada. Edward Van der Pyl is president.

The Triplex Mfg. Co., Hartford City, Ind., has been incorporated with capital stock of \$100,000 and will manufacture moving picture machines for industrial and educational purposes. It has its own plant and necessary equipment, but will be obliged to have castings and metal parts made by contract. At the present time it is in the market for die castings and is seeking to locate a source of supply for this material, as well as punch press and screw machine products. Later on it will be in the market for additional machinery. C. F. Rutledge heads the company.

The California Cyanide Co. has been organized by the Air Reduction Co., 342 Madison Avenue, New York, in conjunction with California interests headed by F. W. Braun of Los Angeles, Cal. The new company has secured a Delaware charter and is capitalized at \$1,100,000. It is understood that the activities of the Cyanide company will follow along the lines of the Air Reduction Co.

George W. Warner & Co., Inc., New York, has been incorporated with capital stock of \$25,000 to manufacture tools and other mechanical equipment. Plans are indefinite, but it is likely that the company will act as distributors for a time and take up the manufacture of pipe tools and equipment later on. It has not yet secured a plant. The incorporators are G. W. and E. S. Warner. Corporate representative is Harry Bloom, 149 Broadway, New York.

Trade Changes

The Poldi Steel Corporation of America, 115 Broadway, New York, has opened a Cleveland office with E. W. Saunders in charge. Mr. Saunders received his early training in the shops of the Pratt & Whitney Co., for whom he later acted as machine tool salesman in the New York district. During recent years he has been in the Cleveland district as sales agent for the Carbon Steel Co., Pittsburgh. Another branch office has been opened at Hartford, Conn., with L. Johnson in charge of the New England district. After receiving a technical education, Mr. Johnson spent several years in various shop capacities, finally joining the Crucible Steel Co. of America in 1916, as salesman and demonstrator. He remained with the company until 1921, since which time he has been with the Poldi corporation. The corporation recently moved its warehouse from 174-75 Spring Street, New York, to larger quarters at 151 Bank Street.

C. P. Thomas of Rock Island, Ill., has purchased the entire assets of the Griswold Mfg. Co., that city. The business will be continued under the new ownership as the Thomas-Kern Co. Besides its former activities the company will enter the light metal specialty engineering field. E. L. Kerns, Moline, Ill., formerly associated with Mr. Thomas, is a partner in the firm.

Peter A. Frasse & Co., Inc., 417 Canal Street, New York, have purchased the entire stock of mechanical seamless steel tubes of the U. T. Hungerford Brass & Copper Co., New York, the latter company having discontinued handling this line.

Westerman & Co., Inc., Lockport, N. Y., announce the completion of facilities for the manufacture of small rounds, squares and flat sections of mild steel. The company states it is in a position to make early deliveries of rounds and squares from $\frac{3}{8}$ to 1 in.

In less than two months after the destruction of the old plant at 741-45 Van Buren Street, Chicago, by fire, the Ampplus Storage Battery Co. is established in a new plant at 429-33 West Superior Street, Chicago, and the manufacture of storage batteries and parts has been resumed under greatly improved conditions.

The Rockford Milling Machine Co., Rockford, Ill., announces the appointment of Manning, Maxwell & Moore, Inc., as exclusive representatives in the Atlanta, Ga., territory. This company will also represent the Rockford Tool Co.

Power division, Los Angeles office, Westinghouse Electric & Mfg. Co., has been changed to the central station

division and J. C. Jones named as manager. Railroad division has been changed to the transportation division and G. B. Kirker made manager. A merchandising division has been established with J. H. Jamison as manager, and an engineering division with R. A. Hopkins as manager.

The Conveyors Corporation of America, 326 West Madison Street, Chicago, announces the appointment of the Irvin C. De Haven Engineering Corporation, State Life Building, Indianapolis, as district representative. The De Haven corporation previously was representative for the Green steam jet ash conveyor which was recently purchased by the Conveyors corporation.

deCourcy Browne, Inc., 120 Broadway, New York, has acquired the exclusive agency for metallic cobalt produced by Henry Wiggin & Co., Ltd., Birmingham, England. The British company was established 70 years ago, and is affiliated with the Mond Nickel Co., Ltd., London. Mr. Browne formerly was connected with the Metal & Thermit Corporation as metallurgical engineer and for a number of years has been interested in promoting the use of metallic cobalt in this country.

The Frank B. Pope Co., Oliver Building, Pittsburgh, has been appointed Pittsburgh district distributor of clay fire brick, sleeves, nozzles and tuyere linings for the LaCled-Christy Clay Products Co., St. Louis.

Industrial News Items

The Hyatt Roller Bearing Co., Newark, N. J., reports increased activity on open-hearth equipment, particularly on ingot mold and charging box cars. During the first quarter of 1923 the company has supplied the improved type of Hyatt bearing to equip 300 open-hearth cars, in 11 steel plants throughout the country. The Hyatt type of steel mill bearing is also to be supplied on the hot beds of the Timken Roller Bearing Co.'s bar mill at Canton, Ohio. Carnegie Steel Co., Homestead Works, has contracted for Hyatt steel mill type bearings to equip completely the two tilting tables for the 140-in. plate mill.

The Keystone Foundry Co., Lebanon, Pa., which was recently organized, is now in operation and producing small gray iron castings. The company occupies a new building, 60 x 160 ft., of steel sash construction, built and erected by the Truscon Steel Co., Youngstown, Ohio. The foundry is equipped with a Paxson cupola of 7-ton capacity, a battery of molding machines supplied by the American Foundry & Equipment Co., a Wilbraham-Green blower, a Swartwout core oven, and other auxiliary equipment of recent design. The foundry will specialize in castings ranging from 1 to 100 lb. J. A. Sowers is president; B. F. Patschke, vice-president; C. T. Shirk, secretary, and J. E. Kreider, treasurer. The foundry has been in operation but a few days and is already well filled with work.

The American Chain Co., York, Pa., has adopted an overtime operating schedule at its local works. The plant is said to be booked solid on the present production basis for the next 90 days.

The Andrew Terry Co., Terryville Conn., manufacturer of malleable iron castings, has advanced the wages of day men, 25c., and women, employed by the day, 20c.; piece workers have received an increase of 10 per cent. The change became operative on March 19.

The Brown-Lipe-Chapin division of the General Motors Corporation, at Syracuse, N. Y., in addition to its regular output of gears, will manufacture carrier units for differential gears. New equipment for this purpose is now being installed.

Officers of the recently organized Stroh-Ilgensfritz Co., Stambaugh Building, Youngstown, Ohio, are J. R. Stroh, president; C. A. Ilgensfritz, vice-president; W. H. Wulf, secretary-treasurer, and they, with Joseph G. Butler, Jr., Henry A. Butler and W. E. Beadling, constitute the board of directors.

License to manufacture the Keystone slipper wire reel for use in wire mills, has been granted the Broden & Daley Construction Co., Cleveland, manufacturer of wire mill equipment. It is stated that over 3000 of these reels are in use in wire mills of the United States.

Reconstruction of the buildings of the David Dunbar Buick Corporation, builder of the Dunbar motor car, Walden, N. Y., has been started by John Fraser, consulting engineer, 30 Church Street, New York. Since the expected capacity of the present plant is but 5000 cars annually plans will be prepared for new assembly and body finishing buildings which, with the present buildings, will give the company a capacity of about 20,000 annually. The site covers about 30 acres and affords good shipping facilities. Production will be under way early this summer.

The McConway & Torley Co., Pittsburgh, has started up its valley steel works and is rolling bars and flats.

Machinery Markets and News of the Works

RAILROADS STILL BUYING

Carriers and Automobile Companies Are Largest Buyers

Lull in Activity in Some Markets as Compared with Recent Weeks

While in some selling centers the machine-tool market gives an appearance of lessened activity, as compared with recent weeks, the volume of buying is still very good in many lines. There are fewer large purchases, but the aggregate of the orders for single tools is running high. A period of prices advancing, such as has just occurred in the trade, is usually followed by a lull in activity, hence it is not surprising that such should be the case now.

There is considerable business pending and as soon as buyers have adjusted their views to the new prices, it is probable that a further spurt in buying will come. At least this is the view of those who are watching conditions closely.

The Cleveland and Detroit districts are active, with a good deal of buying by the automobile companies, but in Chicago there is a quieter market and the same is true to some extent in parts of the East. Last week

the Chevrolet Motor Co. purchased about \$35,000 worth of tools and a number of machines was bought by the Packard and Cadillac companies. Other large buyers in the industrial field were the Morgan Engineering Co., Alliance, Ohio, which bought about a dozen machines for locomotive repair work; the Duplex Printing Press Co., Battle Creek, Mich., and the Pioneer Rubber Mold Co., Cleveland, each taking a half dozen machines.

In the railroad field there is still a considerable volume of buying. The Union Pacific has purchased about a dozen machines and the Southern Railway has bought against its recent inquiry for about 12 machines. The Chicago & North Western is expected to put out a large number of additional inquiries this week. Other Chicago roads are also believed to be about to enter the market in a large way. The International Great Northern Railroad has issued an inquiry for 15 machines, including 10 engine lathes. The Wabash Railroad has bought at St. Louis a considerable number of machine tools, jacks and other shop equipment.

A Middle Western manufacturer of turret lathes, boring mills and grinders has advanced prices about 10 per cent and a Cincinnati manufacturer of shapers has put up his prices and a general advance is expected.

New York

NEW YORK, April 17.

THERE has been a slight lull in buying of machine tools in this territory the past week, but the volume is fairly satisfactory, though mostly in orders for single machines. The demand for second-hand tools is quite active, due to a considerable number of machines in good condition having recently come on the market and also to the fact that such machines can usually be obtained for quick delivery. The largest order of the week was for 40 Heald No. 72 internal grinders, which have been bought by a large company making roller bearings. This order had been under negotiation for some months.

Railroads and railroad equipment companies continue to buy. The Southern Railway has placed orders against its recent inquiry for about a dozen machines. The Wabash Railroad is also buying at St. Louis and some of these orders have come to Eastern tool builders. The New York Central has bought an axle lathe. Other orders for large machines which have come from the West cover a 42-in. boring mill taken by the Alaskan Engineering Commission, Seattle, Wash., a rod borer and 6-ft. radial drill bought by the Morgan Engineering Co., Alliance, Ohio; a 400-ton wheel press and 48-in. car wheel lathe bought by the Midwest Engine Co., Indianapolis, Ind. Two small lists from companies in the Pittsburgh district for second-hand tools have come to New York dealers, one from the Liggett Spring & Axle Co., Monongahela, Pa., calling for prices on four tools and the other from the Union Electric Steel Co., Pittsburgh, asking prices on four tools.

Bids will soon be asked for the erection of a two-story addition to the plant of the Marko Storage Battery Co., 102 Jefferson Avenue, Brooklyn, 70 x 90 ft., estimated to cost \$55,000 with equipment. Montrose Morris Sons, 533 Nostrand Avenue, are architects.

O. & C. Johnson, Inc., Long Island City, manufacturer

of motor trucks and parts, has leased the factory on Seventh Street, near Jackson Avenue, of the Realty Mfg. Comb Co. for a new plant.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until April 24 for one acetylene generator for the Brooklyn Navy Yard, schedule 708.

The Hays-Hunt Body Corporation, J. H. Hays, president, Madison Avenue and Sixty-third Street, New York, is considering the erection of a new six-story plant at Lansing, Mich., estimated to cost \$300,000 with machinery.

Merola Brothers, 2372 First Avenue, New York, general contractors, will build a machine and repair shop at their yard, to cost about \$25,000.

The Board of Water Commissioners, Locust Valley, N. Y., will receive bids until April 24 for motor-driven pumping machinery, turbine type, and auxiliary equipment, for a new waterworks system; also for a standpipe, 42 ft. diameter and 75 ft. high, with capacity of 770,000 gal. Sidney B. Bowne, Post Office Building, Mineola, L. I., is engineer.

The State Government, Brisbane, Queensland, Australia, is considering plans for a new sugar mill in the Tully-Banyan district, estimated to cost \$2,000,000 with machinery. The Australian Sugar Producers' Association is interested.

Ovens, power equipment, conveying machinery, etc., will be installed in the three-story and basement baking plant addition, 100 x 150 ft., to be erected by the Horn & Hardart Co., 600 West Fifth Street, New York, to cost \$110,000 with machinery. F. P. Platt & Brothers, 680 Fifth Avenue, are architects.

The General Electric Co., Schenectady, N. Y., has awarded contracts for three additions as follows: One-story, 100 x 850 ft., to building 85, to the H. K. Ferguson Co., Cleveland, to cost \$250,000; one-story, 46 x 430 ft., to building 60, to Brown & Lowe, Schenectady, to cost \$70,000; and one-story, 120 x 200 ft., to the Austin Co., Cleveland, to building 103, to cost \$55,000.

The Poirer Heating & Plumbing Co., 1217 West Street, Utica, N. Y., is inquiring for a motor-driven punch press for handling thin steel sheets.

A manual training department will be installed in the new two-story high school to be erected at Saranac Lake, N. Y., estimated to cost \$150,000, for which bids on a general contract will be received until April 30. William G. Distin, Main Street, is architect.

The Crane Market

SALES and current inquiries on both electric overhead and locomotive cranes are numerous. Quotations on overhead cranes exhibit an upward tendency and builders of hand-power equipment have in many instances advanced their prices. While new inquiries are not quite as numerous this week as previously, there is a large amount of business pending. Among current inquiries is one from the Pennsylvania Railroad, Eastern Region, Philadelphia, for three 5-ton, single I beam cranes. The Brooklyn Edison Co., Brooklyn, N. Y., has been receiving bids on a 35-ton and a 60-ton overhead crane. The 35-ton, 1-motor and 60-ton overhead traveling cranes for the Phoenix Utility Co., 71 Broadway, New York, are about to be awarded. The formal inquiry of the Metal & Thermit Corporation, 120 Broadway, New York, for five cranes for erection in California, has been issued. The engineer in charge of the purchase of these cranes is Frank I. Ellis, Pittsburgh. They consist of one 75-ton, 50-ft. span, one 15-ton, 55-ft. span and a 15-ton, 60-ft. span, one 40-ton, 80-ft. span and a 10-ton, 80-ft. span, electric traveling cranes. The Westinghouse Electric & Mfg. Co., which recently inquired for a 60-ton overhead traveling crane is reported to have temporarily postponed purchase. The General Electric Co., Schenectady, N. Y., which has an inquiry current for a 2-ton crane for Schenectady, is also receiving bids on about four small cranes for Pittsfield, Mass., and a 20-ton crane for Lynn, Mass. The American Short Line Railroad Association, 611 Railway Exchange, Chicago, is accepting bids on a 75 to 100-ton wrecking crane. While use of electric overhead and locomotive cranes are not particularly numerous at present, there is a fairly large offering of electric and hand power and a few locomotive cranes being made by Harris Brothers Co., of Chicago, with office in New York at 17 State Street. This equipment is the installation at the plant of the Standard Shipbuilding Co., Shooters Island in New York Harbor. It includes about 35 hand and hydraulic operated jib cranes, some with chain and some with electric hoists; two outside gantry cranes; two derricks; ten 10-ton, 56-ft. span Champion electric traveling cranes; two 50-ton,

56-ft. span Sellers electric traveling cranes; two 35-ton, 42-ft. span Niles electric cranes; a 35-ton, 42-ft. span and a 25-ton, 56-ft. span Morgan electric traveling crane; and a runway of two I beams for a Shepard electric hoist. There are also three 10-ton Ohio locomotive cranes and two small capacity, 4-wheel locomotive cranes.

Among recent sales are:

General Electric Co., Schenectady, N. Y., a 50-ton overhead traveling crane from the Alliance Machine Co. The 15-ton gantry crane included in this inquiry has been postponed.

The New Jersey Zinc Co., Front and Fletcher Streets, New York, a 15-ton locomotive crane from the Brown Hoisting Machinery Co.

American Cyanamid Co., 511 Fifth Avenue, New York, a 15-ton locomotive crane from the Browning Co.

Semet-Solvay Co., Syracuse, N. Y., a 20-ton locomotive crane from the Browning Co.

Municipal Gas Co., Albany, N. Y., a 15-ton locomotive crane from the Link-Belt Co.

International Great Northern Railroad Co., Houston, Tex., a 120-ton wrecking crane from the Industrial Works.

Julius Seidel Lumber Co., 2000 South Kingshighway, St. Louis, Mo., a 12 $\frac{1}{4}$ -ton, 50-ft. boom, single drum locomotive crane from the Industrial Works.

Ice Service Co., 68 Ninth Avenue, New York, a 5-ton hand power crane from the New Jersey Foundry & Machine Co.

Atlas Iron Works, New York, a 3-ton, underhung, hand power crane from Chisholm-Moore Mfg. Co., through Mooney, Douglas & Pearson, 193 Greenwich Street, New York.

Phoenix Utility Co., 71 Broadway, New York, a 32-ton, stationary hand-power hoist from Alfred Box & Co.

The members of the Electric Hoist Manufacturers' Association report an increase over the previous month in the number of hoists ordered during March amounting to 12.111 per cent and an increase in the value of hoists ordered amounting to 12.763 per cent. Shipments of hoists increased over the previous month 2.197 per cent.

The Schiller Electric Co., 1402 Francis Street, Utica, N. Y., is planning the erection of a new machine shop at Warren and Genesee Streets, to cost \$35,000.

The Record Co., Second and State Streets, Elmira, N. Y., operating a machine shop, has inquiries out for a radial drill.

The United Electric Light and Power Co., 130 East Fifteenth Street, New York, will take bids on a general contract for a new plant unit at its Hell Gate electric generating plant.

The Stone & Tile Art Co., 300 Ocean Avenue, Jersey City, N. J., is planning for the installation of hoisting equipment, compressed air type, with capacity from 1500 to 2000 lb.

A manual training department will be installed in the two-story and basement high school, 72 x 120 ft., to be erected at Newport, N. J., for which bids have been called on a general contract, to cost \$100,000. Arthur H. Bowditch, 44 Bromfield Street, Boston, is architect.

The Lakewood Coast Electric Co., Lakewood, N. J., contemplates extensions and improvements in its plant and system. Permission has been secured to issue bonds for \$357,000, a portion of the funds to be used for this purpose.

The Beller Electric Supply Co., 283 Market Street, Newark, has leased the three-story factory at 8 Kirk Place, for a new plant.

The Link Column Co., 649 Ferry Street, Newark, manufacturer of steel-concrete columns and posts, will commence the erection of a new one-story addition.

Officials of the Public Service Corporation, Public Service Terminal, Newark, have organized a subsidiary company, the Public Service Electric Power Co., to build a steam-operated generating plant in the meadow section, with initial capacity of 200,000 hp., which later will be doubled to 400,000 hp. The new organization is disposing of a bond issue of \$15,000,000, to be used for the construction, estimated at \$20,000,000, for the first unit. The plant will be operated by the Public Service Co., a going subsidiary, which will proceed with the construction of three new units at the present Point-No-Point power plant, each of 25,000-kw. capacity, expected to be completed early next year. The Public Service Production Co., another subsidiary, has tentative plans for the construction of a quarrying and stone-crushing plant at Rolesville, near Wake Forest, N. C., estimated to cost \$800,000

with machinery and other apparatus. Thomas N. McCarter is president.

The Queens Tool & Metal Products Co., 990 Wyckoff Avenue, Brooklyn, is in the market for a power press, 3-in. stroke, 10-in. bolster space, similar to Bliss No. 21 type.

The Western Electric Co., 159 Broadway, New York, will erect a manufacturing plant at Kearny, N. J., on 55 acres recently acquired. The company also has under way a merchandise building in Chicago, which will cost more than \$1,000,000 and provide 100,000 sq. ft. of floor space. Other projects under way, all at Chicago, include a \$1,000,000 wood-working shop, a copper rod and wire mill, which will cost approximately \$2,000,000, and a locker house for the athletes among its 31,000 employees there, and a new machine shop, each of the last two to cost about \$200,000. No figure has been set on the cost of the Kearny, N. J., project.

New England

BOSTON, April 16.

MACHINE tool sales took an abrupt drop the past week, with no business of noteworthy importance. From the standpoint of value, however, the purchase of two large grinding machines by a Worcester textile machinery maker, a duplication of an order placed the previous week was the most important transaction. Dealers look upon the lull as only temporary and are actively negotiating with a large number of prospects, giving every promise of closing this month. Several moderately large individual inquiries are in the market, but the strength of the situation lies in the number of requests for prices on one, two and three tools.

A New England manufacturer of presses has taken some good business from a Boston meat canning plant, the presses being adapted to can sealing. Possibly 65 to 70 per cent of the machine tool sales since last reports call for new equipment. Prices on at least one make of screw machines are slightly higher.

The Southington Hardware Co., Southington, Conn., has awarded contract for a 50 x 105 ft. addition for warehouse

and storeroom purposes, and not manufacturing, as reported.

The Blake Pump Co., Fitchburg, Mass., has completed arrangements for the manufacture of the James L. Pilling line of electric and air-driven engines, turntable tractors, hoists. Mr. Pilling, who has made his headquarters at Athol, Mass., for some years, will be actively associated with the Fitchburg company.

Richard A. Hurley, acting as agent for the Franklin Machine Co., purchased at auction most of the plant and land of the American & British Mfg. Co., Providence, R. I. Among the purchasers of machinery were R. J. Metzler, New York; the Acme Machinery Co., New York; and the Brownell Machinery Co., Providence. The plant originally was erected by the Corliss Steam Engine Works, of which the late George H. Corliss was the founder.

The property and equipment of the Metz Co., Waltham, Mass., automobiles, will be sold April 25, 26, 27 and 28. Twelve makes of millers, 16 of lathes and 12 makes of drills are included in the list to be sold.

The Colonial Brass Works, Inc., New Britain, Conn., has purchased the property of Henry C. and Alice T. Baum, Plainville, Conn., consisting of a two-story factory and about eight acres of land. The new owners will erect a foundry and make other improvements. Mr. Baum will erect a new plant near the one just sold.

The Springfield Malleable Iron Co., Springfield, Mass., capitalized for \$250,000, has incorporated under Massachusetts laws with the following officers: H. P. Blumenauer, president; George T. Dewey, treasurer; William H. Gates, clerk, all of Worcester, and closely identified with the Arcade Malleable Iron Co. The company recently acquired a foundry in Springfield and will make aluminum and malleable castings.

Various kinds of electrical equipment and apparatus will be required for the one-story addition, 50 x 300 ft., to the International Paper Box Machine Co., Nashua, N. H.

A limited amount of pulleys, shafting, hangers and leather belting will be purchased for the two-story, 30 x 120 ft. addition to the Meade Rubber Co., Brook Street, Stoughton, Mass. Charles Meade is manager.

The Manchester Foundry Co., Manchester, N. H., has decided not to purchase a 3-ton hand hoist for which it was in the market. It will build a hoist of its own design.

The Hurlburt-Rogers Machine Shop, South Sudbury, Mass., was destroyed by fire last week. The company for many years made machine tools, but recently was purchased by the Flather Machine Co., Nashua, N. H., for the manufacture of cutting tools. The plant was valued at about \$25,000.

Two 1800 hp. turbines and other equipment will be required by the Farmington River Hydro-Electric Corporation, Winsted, Conn., according to plans just completed for the development of water power on the Farmington River, above the Colebrook River.

The Portsmouth Coach Co., Portsmouth, N. H., has plans for the erection of a one and one-half story building, 40 x 200 ft., to manufacture automobile bodies and to cost about \$50,000. Ralph B. Phillips is head.

Plans are being considered by the Acme White Lead & Color Co., 266 Border Street, East Boston, for rebuilding the portion of its plant destroyed by fire April 6, with loss of about \$65,000, including machinery.

Landers, Frary & Clark, Inc., New Britain, Conn., has plans for a three-story addition, to cost about \$65,000. It is arranging for the removal of its shear and cutlery plant on Sussex Avenue, Newark, N. J., to the New Britain works, and will increase this line of production. Max J. Unkelbach, 162 Main Street, New Britain, is architect.

The Hollingsworth & Whitney Co., 185 Devonshire Street, Boston, manufacturer of paper products, has plans for a new mill at Calais, Me., for pulp and paper production, estimated to cost \$200,000.

The Connecticut Telephone & Electric Co., Meriden, Conn., manufacturer of wireless and electrical instruments, etc., will take bids for the erection of an addition. Walter T. Arnold, Meriden, is architect. Fred L. Wood is one of the heads of the company.

The Maine Central Railroad Co., Portland, Me., has taken bids for new car and locomotive shops at South Portland, to be operated by the Portland Terminal Co., estimated to cost \$1,500,000 with machinery. A power house will be included.

The Department of Public Works, South Norwalk, Conn., has authorized plans for an addition to the municipal electric power plant, to cost about \$300,000 with machinery. Westcott & Mapes, Inc., New Haven, Conn., is architect and engineer.

Philadelphia

PHILADELPHIA, April 16.

THE Pennsylvania Equipment Co., Norwood Station, Pa., is in the market for a second-hand hollow spindle engine lathe, 16 or 18 in., with taper attachment; 10 or 12 ft. bed.; also good face plate and universal four-jawed chuck.

The Bureau of Yards and Docks, Navy Department, Washington, is preparing plans for additions to the aircraft plant at the Philadelphia Navy Yard, to include an engine testing department, and engine and metal-treating shop. The work will be handled under specifications 4835 and 4839.

The American Bag & Paper Co., Second and Vine Streets, Philadelphia, has awarded contract to the Wark Co., 231 South Broad Street, for a new six-story and basement plant, 88 x 275 ft., estimated to cost \$600,000 with machinery. Clarence E. Wunder, 1415 Locust Street, is architect.

The Thomas H. Dallett Co., 1324 Federal Street, Philadelphia, manufacturer of pneumatic tools and parts, has awarded contract to the Truscon Steel Co., for a new plant at Clearfield and Hancock Streets. The company has also acquired the one-story factory, on site 195 x 210 ft., at Clearfield and Mascher Streets, from the Standard Crown Co., for \$65,000.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has inquiries out for a 42-in. vertical punch, and 48-in. planer.

Frank H. Caven, Room 416, City Hall, Philadelphia, director, Department of Public Works, will receive bids until April 25 for electrical equipment for installation in the Northeast Sewerage Treatment Plant, as per specifications on file. The work will be handled as Contract No. 2.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 1 for 1000 pistons for Liberty aircraft engines, for the Philadelphia aircraft factory, schedule 719.

Contract has been let by the American Engineering Co., Aramingo and Cumberland Streets, Philadelphia, manufacturer of machinery, castings, etc., to the Herbert H. Conway Co., Fifty-eighth and Walnut Streets, for a one-story foundry to cost about \$25,000.

Plans are being drawn by William Lowenthal, 1208 Chestnut Street, Philadelphia, architect and engineer, for a power house at the plant of the Modern Laundry Co., Forty-first and Filbert Streets.

The Neel-Cadillac Co., 142 North Broad Street, Philadelphia, local representative for the Cadillac automobile, will install a machine and repair shop in its new building on Federal Street, Camden, N. J., for which contract has just been awarded to Mitchell Brothers, 2125 Race Street. It will cost about \$100,000.

A manual training department will be installed in the new three-story and basement high school, 175 x 235 ft., to be erected at Haddon Heights, N. J., estimated to cost \$400,000, for which bids have been asked on a general contract. Charles R. Peddle, 136 South Fourth Street, Philadelphia, is architect.

The Philadelphia Commercial Museum, Thirty-fourth Street, has received an inquiry from a company at Rotterdam which is in the market for small tools, including braces, drills, saws, etc., and from a company at Kingston, Jamaica, which wishes to get in touch with American manufacturers of portable drilling machines for well-boring, hydraulic rams and kindred machinery.

A manual training department will be installed in the new high school addition to be erected at Etna, Pa., estimated to cost \$85,000. E. M. Pickin, Allentown, Pa., is architect.

The Stanley Steel Welded Wheel Corporation, 184 Boylston Street, Boston, is considering the purchase of a site near Wilkes-Barre, Pa., approximating 15 acres, for a new plant. It is purposed to remove the main plant at Boston to the new location.

The American Air Stand Mfg. Co., Jersey Shore, Pa., manufacturer of air and water distributing machines for garages, is planning the erection of a new two-story factory on Main Street, estimated to cost \$55,000 with equipment.

Electrically-operated pumping machinery will be installed in the new filter plant to be built at the municipal waterworks by the City Council, Reading, Pa., for which a bond issue will be arranged at an early date.

The National Radiator Co., New Castle, Pa., has construction in progress on an addition to its foundry to double, approximately, the present capacity.

A manual training department will be installed in the

new high school to be erected at Duncannon, Pa., estimated to cost \$80,000, for which bids have been asked on a general contract. Lawrie-Green & Co., 222 Market Street, Harrisburg, Pa., are architects.

The Metropolitan Edison Co., Reading, Pa., has acquired the power plants and systems of the Hanover Power Co., Hanover, Pa., and the Gettysburg Electric Co., Gettysburg, Pa., and will make extensions and improvements, and merge the properties. Officials of the company have organized the Metropolitan Power Co., to carry out the proposed project for a large central steam-operated generating plant on the Susquehanna River, Middletown, Pa., for which plans have been completed. The first unit will have a capacity of 30,000 kw., and will cost \$1,000,000. Later units will increase the investment to more than \$3,000,000.

Lloyd Geist, Coplay, Pa., will make extensions and improvements in his cement, brick and concrete products plant on Front Street. Additional machinery will be installed.

Carrick & Husted, 1933 Cherry Street, Philadelphia, operating a metal-plating and general metal works, are said to be arranging a list of equipment for installation in their proposed new plant, including buffing machines, electroplating equipment, motors, etc.

Three large slate quarries have applied for service from Pennsylvania Edison Co., and each will install a large synchronous motor to operate an air compressor as the principal part of their 300-hp. load.

Baltimore

BALTIMORE, April 16.

A 1000-hp. power house will be built by the Baltimore & Ohio Railroad Co., Baltimore, in connection with its new grain elevator at Locust Point, on which work will commence at once. All machinery units will be electrically operated. The entire plant will cost \$5,500,000.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, has acquired 45 acres on Fifth Avenue, Baltimore, as a site for a new plant to manufacture sanitary enameled iron products. The works will include a foundry, core department, sand blast department, enameling mill, furnace department, machine shop, power house and other structures, and are estimated to cost \$2,500,000 with machinery. Theodore Ahrens is president.

A manual training department will be installed in the new junior high school to be erected in the Gynns Falls Park section, Baltimore, estimated to cost \$500,000, for which bids are being asked on a general contract. Smith & May, Calvert Building, are architects.

The Junction City Sand Co., Junction City, Ga., is in the market for a quantity of wire rope, $\frac{3}{4}$ or 1 in. diameter, with clips. O. A. Nix is general manager.

The Treasury Department, Washington, office of the supervising architect, will receive bids until May 7 for two horizontal return tubular high pressure boilers, with hand stokers and auxiliary equipment, for installation at the power house at the United States Veterans' Hospital, Queen, N. C.

The Bureau of Yards and Docks, Navy Department, Washington, will soon take bids for power equipment and piping for the power plant at the navy yard, Yorktown, Va., specification 4826; also, for a water softening plant at Annapolis, Md., specification 4836.

The High Carbon Coal Co., Pulaski, Va., recently organized with a capital of \$1,000,000, is planning for the installation of electrical machinery, hoisting equipment, cars, and other machinery, at its local properties. C. E. Smith is president, and J. W. Miller, secretary-treasurer.

The Chesapeake & Ohio Railroad Co., Richmond, Va., has tentative plans for the construction of a new terminal yard and shops at Newport News, Va., with capacity for handling 1000 cars. The plant will include an engine house, machine shops, coaling station, ash-handling plant, and other structures, estimated to cost \$750,000 with equipment. A new steel pier with cranes and other machinery is also planned, replacing present pier No. 10, estimated at \$2,500,000. Coal piers with handling machinery, including improvements to pier No. 9, will cost \$750,000. C. W. Johns is chief engineer.

The American Can Co., 120 Broadway, New York, is contemplating the erection of a four-story addition to its plant at Boston and Hudson Streets, Baltimore, to be 90 x 200 ft., and estimated to cost \$250,000. A machine shop will be installed.

A manual training department will be installed in the new high school to be erected at Gaffney, S. C., estimated

to cost \$150,000. James J. Baldwin, Anderson, S. C., is architect.

The Board of Directors, Appalachian Training School, Boone, N. C., is in the market for a generator, switchboard and other electrical equipment for the power plant.

T. L. Eberhardt, R. F. D. No. 3, Chester, S. C., is in the market for pumping machinery, with capacity of 175 gal. per min.

D. C. Elphinstone, 408 Continental Building, Baltimore, machinery dealer, is inquiring for a 20-ton locomotive crane, 50 ft. boom.

The Union Cotton Oil Co., Fitzgerald, Ga., has plans for the erection of a new box factory, estimated to cost \$40,000 with machinery and power equipment.

Plans are being considered for rebuilding the portion of the plant of the Baltimore Paint & Color Works, Frederick and Calverton Roads, Baltimore, destroyed by fire April 11, with loss estimated at \$50,000, including machinery.

The Quartermaster, Marine Barracks, Paris Island, S. C., will receive bids until April 24 for one oil pump, gate valves, rawhide belt lacing and other equipment.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until May 8 for a quantity of carbon and high-speed twist drills for Eastern and Western yards, schedule 727; a quantity of wrenches, schedule 724; and pliers, schedule 725; until May 1, for 22 coils of band saws for the Norfolk, Va., Navy Yard, schedule 722.

The Summerland Creamery Co., Batesburg, S. C., is in the market for deepwell pumping machinery, with capacity of about 50 gal. per min.

The Wilson-Hock Co., City Point, Va., machinery dealer, is in the market for a lathe, 18 in. x 7 ft.; an 18 or 20-in. shaper, and a small drill press; one 150 to 350-kw. generator, direct-connected, or with engine for driving belted generator; one 200 kva. generator, direct-connected, or with engine; one 50 kw. generator, 224 volts; and switchboard.

The Ford Motor Co., Highland Park, Mich., has authorized enlargements and improvements at its assembling plant at Atlanta, Ga., including the installation of additional machinery for a capacity of 250 automobiles daily.

The South Georgia Public Service Co., Americus, Ga., has acquired the plant and system of the Americus Lighting Co. Plans are under way for extensions and improvements, including new transmission lines to Albany, Ga. Additional machinery will be installed.

The Lanier County Power Co., Milltown, Ga., recently organized with a capital of \$1,000,000, has plans for a new hydroelectric power plant at Lake Irma, estimated to cost \$350,000.

A power plant will be constructed by the Pacific Mills, Duncan, S. C., in connection with their new cotton mill, estimated to cost \$500,000. A pumping plant will also be installed. Lockwood, Greene & Co., Piedmont Building, Charlotte, N. C., are engineers.

The Bureau of Yards and Docks, Navy Department, Washington, will soon call for bids for refrigerating machinery for installation at the navy yard at Pearl Harbor, H. T., specification 4767.

The Taylor-Parker Co., Water Street and Commercial Place, Norfolk, Va., machinery dealer, is in the market for a four-valve stationary engine, automatic, 300 hp., similar to Erie City or Clark Brothers type.

The Exum Side Dump Vehicle Co., Milltown, Ga., recently organized with a capital of \$500,000, has plans for the establishment of a new works to manufacture dump carts and other commercial vehicles and parts, estimated to cost \$100,000. J. K. Exum, Milltown, heads the company.

The Switch Plate Corporation, 729 Duke Street, Norfolk, Va., recently formed with a capital of \$100,000, has acquired a local building and will soon commence the installation of machinery, gang drills, presses and other machine tools and equipment. S. W. Harris is president; Fred Saunders is general manager.

A manual training department will be installed in the new high school to be erected at Leesburg, N. C., estimated to cost \$80,000, for which plans will soon be prepared.

Pepper Brothers, Danbury, N. C., operating a roller mill, are in the market for machinery for a hydroelectric power plant, including water wheel and generator. E. P. Pepper is in charge.

Plans for the new works to be built for Union Brothers, furniture manufacturers, at 37 West Cross Street, Baltimore, provide for a three-story and basement structure, 50 x 140 ft., and will cost \$36,000.

Pittsburgh

PITTSBURGH, April 16.

MACHINE tool market activities have been on a somewhat larger scale the past week. Crane awards have also been fairly good, although some disposition is shown by prospective buyers to defer projects, as total costs now run considerably in excess of original estimates.

Some makers of shapers and grinders have announced an advance of about 10 per cent in prices, but as yet the increase in power equipment has not been made. Crane prices tend higher, this being seen more in withdrawals of quotations or the setting of a limit for their acceptance rather than in a definite increase.

The Westinghouse Electric & Mfg. Co., East Pittsburgh, has bought a Pels bar shear for its turbine division, while the Pittsburgh & West Virginia Railway appears in the list of tool buyers as the purchaser of an Ingersoll-Rand air compressor, and the Vanadium Alloys Steel Co., Latrobe, Pa., and the Wheeling Steel Castings Co., Wheeling, W. Va., as purchasers of Sutton-Abramsen straightening machines. A number of sheet steel shears also have been sold in the past week.

The Jones & Laughlin Steel Corporation has closed for a 40-ton, with 25-ton auxiliary, 67-ft. 7-in. span crane for its Eliza furnace with the Alliance Machine Co. The Pittsburgh-Des Moines Steel Co. has bought for its Des Moines plant a 10-ton, 3-motor, 64-ft. span crane from the Milwaukee Electric Crane & Mfg. Co. The number of cranes for the new Pacific Coast sheet mill plant of the Metal & Thermit Corporation has been reduced from seven to four. An award is probable this week. The Whiting Corporation has been awarded a 15-ton crane by the Navy Department for its Puget Sound yard.

The Centre Foundry & Machine Co. has moved from Wheeling, W. Va., to its new factory in Warwood, W. Va. Completion of the new plant was set back by delays in deliveries of equipment incident to railroad transportation. The old plant will be converted into an assembling plant for the Ford Motor Co.

Plans are being prepared for a new one-story building, 120 x 182 ft., for the McKinney Mfg. Co., Metropolitan and Liverpool Streets, manufacturer of hardware products, estimated to cost \$100,000 with equipment. The Hunting-Davis Co., Century Building, is architect. Joseph McKinney, Jr., is secretary.

The Heidenkamp Plate Glass Corporation, Springdale, Pa., recently organized to take over the plant and business of the Heidenkamp Plate Glass Co., has plans for additions to increase the output about 50 per cent. Bonds for \$1,000,000 are being sold, the majority of the proceeds to be used for the new buildings and machinery. Frank E. Troutman, vice-president and general manager, is in charge. Warren H. Turner, an official of the Hires-Turner Glass Co., Thirtieth Street, Philadelphia, is president.

A manual training department will be installed in the addition to be erected at the South Hills high school, Pittsburgh, estimated to cost \$1,000,000, for which bids will soon be called. The Board of Education is in charge.

The Richmond Radiator Co., Uniontown, Pa., is perfecting plans for enlargements in its radiator and enameling plants.

Fire, April 6, destroyed a portion of the plant of the United States Fiber Box Co., Warwood, W. Va., with loss of \$110,000 including machinery. It is planned to rebuild.

The United Steel & Car Co., Martinsburg, W. Va., has taken options on a local site and contemplates the erection of a new plant, comprising machine shops, foundry, car repair shops and power house, estimated to cost \$1,500,000, with equipment. F. Vernon Aler, Dean Building, is general counsel and representative.

The Virginia Coal & Coke Co., Norton, W. Va., plans the erection of a one-story machine shop, 60 x 100 ft., to cost about \$20,000. Leonard Everett is head.

The Guyan Machine Shops, Logan, W. Va., machinery dealers, have inquiries out for conveying machinery, with transmission fittings; also, 5, 10 and 15-hp. motors, three-phase, 60-cycle; one high speed elevator, 1000 lb. capacity; 30-in. diameter pulleys for 36-in. belting, and a quantity of 4 x 3-in. angle iron.

The Spartansburg Oil & Gas Co., Spartansburg, Pa., will commence the erection of a new refinery estimated to cost \$150,000. The company was recently organized.

The Skinner Engine Co., Twelfth and Chestnut Streets, Erie, Pa., is considering the installation of a number of machine tools and other equipment.

The Ohio & Pennsylvania Power Co., Beech Bottom, W. Va., with operating office at East Liverpool, Ohio, has plans for a new generating plant in the vicinity of Toronto, Ohio, with initial unit estimated to cost \$1,000,000.

The American Fruit Co., 81 East Naughten Street, Columbus, Ohio, will take bids for a three-story cold storage and refrigerating plant at Williamson, W. Va., estimated to cost \$85,000.

The Lewis County Cut Glass Co., Weston, W. Va., is planning for the installation of transmission equipment, including belting, shafting, pulleys, hangers, etc.

A manual training department will be installed in the new high school to be erected at Albion, Pa., estimated to cost \$100,000. Kirby & Johnson, Baker Building, Erie, Pa., are architects.

Buffalo

BUFFALO, April 16.

THE plant and property of the Parenti Motors Corporation, Kensington and Northumberland Avenues, Buffalo, bankrupt, have been acquired by the Hanover Motor Car Co., Hanover, Pa., at a public sale for \$225,000. The new owner will use the plant for automobile manufacture.

The A. F. Myers Corporation, 298 Pratt Street, Buffalo, manufacturer of soda fountains and equipment, has plans for a new two-story factory. A list of machinery to be installed will soon be prepared.

A manual training department will be installed in the new junior high school to be erected at Canandaigua, N. Y., estimated to cost \$200,000, for which an architect will soon be selected.

The Board of Water Commissioners, Macedon, N. Y., will receive bids until May 1 for pumping machinery and accessory equipment for a new water-works plant. Hopkins & Field, 349 Cutler Building, Rochester, N. Y., are engineers.

A manual training department will be installed in the new two-story high school addition to be erected at Newfane, N. Y., to cost \$100,000, for which bids are being received on a general contract. W. S. Brickell, 132 Ellicott Square, Buffalo, is architect.

George C. Dewald, 152 Greenfield Avenue, Buffalo, has taken over the building at 1016 Jefferson Avenue, heretofore used for the manufacture of evaporating machinery and boilers, and will use the structure, 44 x 178 ft., as a machine shop.

The Newark Cold Storage Co., Newark, N. Y., is contemplating the erection of a new cold storage and refrigerating plant to cost \$250,000, with machinery. Headquarters are in the First National Bank Building. E. V. Pierson is secretary.

In addition to its proposed new power plant on the Oswegatchie River, to cost about \$500,000, the Power Corporation of New York, Northern New York Trust Building, Watertown, is planning for the construction of a hydro-electric power plant at Effley Falls, and for the erection of an addition to the present 3,500 hp. station near Herring, N. Y., to double the capacity. W. P. Creager, address noted, is engineer.

The Standard Oil Co., Fidelity Building, Buffalo, will build a new pumping plant at its works at Elk and Babcock Streets.

The Alliance Furniture Co., 615 Allen Street, Jamestown, N. Y., will arrange a list of machinery for installation in its proposed four-story addition.

The Town Board, Tonawanda, N. Y., with offices at 2852 Delaware Avenue, Kenmore, N. Y., will receive bids until April 21 for pumping machinery and auxiliary equipment for a pumping station for a new sewerage system. George C. Diehl, 575 Ellicott Square, Buffalo, is engineer.

The Taggart Brothers Paper Co., West Main Street, Watertown, N. Y., plans the installation of an air-operated rock drill and air compressor.

The Syracuse Lighting Co., Syracuse, N. Y., is contemplating extensions and improvements in its generating plants and system, including the installation of additional machinery. The company is a subsidiary of the United Gas Improvement Co., Broad and Arch Streets, Philadelphia, and has arranged a fund of \$4,000,000 for expansion during the next 18 months.

A machine shop will be installed in the one-story automobile service building to be erected by H. S. Day, East Main Street, Malone, N. Y., to cost about \$100,000.

The Black Rock Milling Corporation, 356 Hertel Street, Buffalo, will install a new mechanical conveyor system to cost about \$17,000.

The Carr Co., Main Street, Ogdensburg, N. Y., operating a machine shop, is inquiring for an upright post drill, high speed twist drills and other equipment.

The Department of Public Works, Albany, N. Y., plans for the erection of a new grain elevator on the State Barge Canal, Oswego, at a cost of \$1,307,000. The installation will include electric conveying and hoisting machinery, mechanical loading and unloading equipment, etc.

Briceland & Cavanaugh, 800 Granklin Street, Watertown, N. Y., operating a machine shop for automobile repairs, plans the installation of a vertical drill, air compressor and other equipment.

Cleveland

CLEVELAND, April 16.

THE volume of orders and prospective machine tool business shows a gain, with buying well distributed among various industries. Demand from Detroit automobile plants continues good. During the week the Chevrolet Motor Co. purchased about \$35,000 worth of machinery and a number of machines were bought by the Packard and Cadillac companies. The demand for punching and shearing machines shows more life, orders coming largely from fabricating shops. Makers of automatic machinery are getting a fair volume of orders for single machines or small lots.

The Morgan Engineering Co., Alliance, Ohio, purchased a dozen machines for locomotive repair work. Several of these were large tools and included a 2-spindle rod boring machine, a flue sheet drilling machine, a 54-in. boring machine and several drilling machines. The Duplex Printing Press Co., Battle Creek, Mich., purchased six machines, and the Pioneer Rubber Mold Co., Cleveland, recently organized to make tire molds, bought six machines.

A Cincinnati manufacturer of shapers has advanced prices and a general raise on these machines is expected. An advance on cutter grinders and milling machines has been made by a Cincinnati manufacturer and higher levels are reported on some makes of radial drills.

The Wellman-Seaver-Morgan Co. has taken the following orders from the Koppers Co. for equipment for coke oven installations: A 5½-ton man trolley coal bridge, new type 60-ft. revolving car dumper, two coke pushers, 4-door lifting machines, and two coal charging cars for the Lackawanna plant of the Bethlehem Steel Co., Buffalo; a coke pusher, door machine, and a coal charging car for the Columbia Steel Co., Provo, Utah; one coke pusher, 2-door machines, and two coal charging cars for the Republic Iron & Steel Co., Youngstown; and a car dumper for the Calumet station of the Commonwealth Edison Co., Chicago. The company also recently took an order from the Utah Copper Co., Salt Lake City, Utah, for two revolving type car dumpers.

H. Selker has sold his interest in the Buckeye Brass Mfg. Co., Cleveland, of which he was president, and purchased the plant of the Regar Brass Co., 1323 East Forty-fifth Street, and changed its name to the Selker Brass Co. Some additional equipment has been purchased for the latter plant, which will manufacture brass and bronze bushings and other products.

The Fairfield Engineering Co. has moved its offices from Lancaster, Ohio, to Marion, where a new plant, 90 x 240 ft., has been erected for the manufacture of conveying machinery. H. B. Walker is president and C. O. Brown, superintendent.

The Northern Blower Co., Cleveland, is in the market for a forming brake of 10 gage capacity of the George A. Oht type or equivalent.

The Ohio Brass Co., Mansfield, Ohio, will make extensions to the plant of the Ohio Insulator Co., Barberton, Ohio, a subsidiary. Two buildings will be erected providing an additional floor space of 16,000 sq. ft.

The Ottawa River Paper Co., Toledo, Ohio, has been organized with a capital stock of \$250,000 preferred stock and 2000 shares no par common stock, and has placed contracts for a two-story building, 100 x 208 ft., which will be the first unit of a plant for the manufacture of corrugated paper boxes. George G. Broderick is president and H. S. Cann, secretary.

The Interlocking Cord Tire Co., Akron, Ohio, is planning to build additional factory units for which foundations were laid some time ago, after which the construction program was suspended.

The Miller Rubber Co., Akron, Ohio, recently took out a permit for a four-story factory, 97 x 235 ft.

The Lima Foundries Co., Lima, Ohio, has purchased the plant it occupies, which will be remodeled and new equipment added. Brass, bronze, aluminum and gray iron castings will be manufactured. J. B. Rountree is president; R. A. Woodruff, vice-president, and J. B. Smith, secretary and treasurer.

The Victor Stove Co., Salem, Ohio, has taken bids for a foundry, 80 x 150 ft.

The Stiegelmyer Mfg. Co., Seymour, Ind., which will build a new plant to manufacture automatic train control devices, has had plans prepared for a foundry, 50 x 140 ft. William G. Lee, Cleveland, president Brotherhood of Railway Trainmen, is president of the company.

Chicago

CHICAGO, April 16.

THE machine tool market is less active than in March, but a pause in buying was to be expected following recent advances. There is considerable business pending, and in view of the steady gain in general industrial activity sellers look forward to the coming months with confidence. The Union Pacific has purchased about 12 additional machines against its list, but otherwise no further railroad buying has been recorded. The Illinois Central has not yet taken action against the remainder of its outstanding list. The Chicago & North Western is expected to put out a large number of additional inquiries early this week. Other roads are also believed to be about to enter the market in a large way.

No further price changes have been reported outside of an advance of 10 per cent by a manufacturer of turret lathes, boring mills and grinders.

The Whiting Corporation, Harvey, Ill., has booked the following orders for cranes and foundry equipment: One 60-ton electric crane for the Phoenix Utility Co., New York; one 15-ton electric traveling crane for the Consumers Power Co., Detroit, Mich.; one 5-ton electric crane for the Lebanon Iron Co., Lebanon, Pa.; one 60-ton transfer table for the Midwest Engine Corporation, Indianapolis, Ind.; two 66-in. cupolas for the United States Radiator Co., Buffalo; two 66-in. cupolas for the plant of the Crane Co. at Chattanooga, Tenn.; one 32-in. cupola for the University of Michigan, Ann Arbor, Mich.; one 54-in. cupola for the Summit Foundry Co., Geneva, Ill.

The Almira Iron Works, 1819-23 North Spaulding Avenue, Chicago, recently incorporated with \$35,000 capital stock, will manufacture structural and miscellaneous iron and steel. It is building a plant at 4020-24 Schubert Avenue. The shop will be constructed of brick, steel and tile, and will be 75 x 115 ft. Equipment to be bought includes combination or individual punches and shears and a cold saw. Officers are William H. Wehrum, president, and Arthur Wehrum, secretary.

John E. Fast & Co., 649 North Parkside Avenue, Chicago, Ill., recently incorporated with \$10,000 capital stock, succeed the business conducted for about four years under the same name. The company manufactures electrical condensers, selling to plants using this apparatus in their product, chiefly to manufacturers of telephones, medical apparatus and ignition apparatus. A small factory is leased and at present no changes are contemplated.

The Edward Katzinger Co., manufacturer of bakers' utensils, tools and machinery, 901 West Washington Street, Chicago, has let a contract for a two-story factory, 243 x 354 ft., on 4701-57 Armitage Avenue, to cost \$600,000.

The Devry Corporation, manufacturer of moving picture machines, 1248 Marianna Avenue, Chicago, has let contract for a two-story factory, 100 x 120 ft., at 1101-1111 Center Street, to cost \$42,000.

R. R. Donnelly & Sons Co., Chicago, has let contract for a one-story printing plant, 150 x 300 ft., at Crawfordville, Ind.

The Chicago, North Shore & Milwaukee Electric Railroad has purchased a 65-acre tract at Waukegan, Ill., and will construct new car shops to cost \$1,000,000. This will involve the removal of the present car barns and repair shops at Highwood.

William Gulden, Weehawken, N. J., has purchased the entire plant and equipment of the bankrupt Composite Metal Lath Co. at New Chicago, near Gary, Ind. Mr. Gulden will resume the manufacture of composite metal lath.

The Anderson Foundry & Machine Works, Anderson, Ind., has awarded contract for a machine shop addition, 80 x 100 ft.

The plant of the Rosen Machine Co., Davenport, Iowa, was recently damaged by fire to the extent of \$4,000.

The Barber-Coleman Co., manufacturer of machine tools, textile machinery, etc., Rockford, Ill., will build an eight-story storage warehouse, 50 x 145 ft., to cost \$100,000.

The Sioux City Foundry & Boiler Co., Sioux City, Iowa, is constructing a warehouse for the storage of steel plates, sheets and boiler tubes, which will enable it to enlarge its boiler manufacturing department.

The Centerville Foundry & Mfg. Co., Centerville, Iowa, recently incorporated with \$100,000 capital stock, will operate a foundry, machine and repair shop for the manufacture of coal cars, car wheels, concrete mixers and other products. Officers are David Steel, Jr., president; A. M. Peatman, vice-president, and J. M. Beck, secretary and treasurer.

Fire recently damaged the plant of the Upland Flint Bottle Co. in North Marion, Ind., causing a loss estimated at \$100,000. It will probably be rebuilt.

The Spiral Co., recently incorporated with \$250,000 capital stock, will enlarge a factory at 998 Raymond Avenue, St. Paul, Minn., and manufacture special boilers and steam heating equipment. Associated in the project are John Olson, patentee, and Conrad Hamm, formerly owner of the St. Paul Souvenir Co.

The Elco Tool & Screw Corporation, Rockford, Ill., has purchased the plant and equipment formerly owned by the Rockford Mfg. Co. at public auction and will use the additional space to expand its output of wood screws.

The Wabash Railroad Co., St. Louis, is preparing plans for a new car repair shop at Decatur, Ill., estimated to cost \$175,000 with machinery.

A vocational department will be installed in the new two-story high school, 105 x 180 ft., to be erected at Ely, Minn., estimated to cost \$750,000, for which bids on a general contract will be called about May 1. W. T. Bray, 600 Torrey Building, Duluth, Minn., is architect.

The City Clerk, Springfield, Ill., will take bids until April 23 for one steam-driven centrifugal pump, with capacity of 10,000,000 gal. per day; also for two motor-driven, low-service centrifugal pumps, with capacity of 3500 gal. per min., as per specifications on file at the office of the Burns & McDonnell Engineering Co., 402 Interstate Building, Kansas City, Mo., engineers.

A manual training department will be installed in the new three-story high school to be erected at Deadwood, S. D., 100 x 240 ft., estimated to cost \$250,000, for which bids will soon be called on a general contract. Perkins & Wayne, Paulton Building, Sioux Falls, S. D., are architects.

A vocational department will be installed in the new two-story and basement high school to be erected at Council Bluffs, Iowa, estimated to cost \$250,000, for which J. C. Jensen, 307 West Broadway, is architect.

The Galesburg Machine Shop, P. O. Box 27, Galesburg, Ill., is planning for the installation of a double crank, back-gear punch press.

Detroit

DETROIT, April 16.

BIDS are being taken for an addition to the plant of the All-Steel Material Co., 5639 Roby Place, Detroit, estimated to cost \$25,000. Robert Finn, McKerchey Building, is architect.

The plant and business of the Sturgis Utility Mfg. Co., Sturgis, Mich., manufacturer of paper products, has been acquired by D. A. Hopping, formerly connected with the National Carbon Coated Paper Co., and associates. The new owners plan for extensions and improvements and the installation of additional equipment.

The Union Steel Products Co., Albion, Mich., has awarded contract to Perry F. Sharp, Albion, for a two-story addition, to double the present capacity. A list of machinery will soon be arranged.

Bids will soon be called for a three-story addition to the plant of the Kalamazoo Paper Box Co., Kalamazoo, Mich., estimated to cost \$200,000 with machinery. Billingham & Cobb, Press Building, are architects.

The Consumers Power Co., Jackson, Mich., is perfecting plans for a new steam-operated power house at Zilwaukee, Mich., with initial capacity of 100,000 hp., estimated to cost \$400,000 with machinery.

The Cadillac Machinery Co., 452 East Lafayette Street, Detroit, plans for the installation of one or more spindle drills, Colburn type.

The Pere Marquette Railroad Co., Grand Rapids, Mich., will commence the erection of a new power plant at its shops at Wyoming, Mich., to cost about \$100,000 with machinery.

Manual training departments will be installed in the two new three-story high schools to be erected at Lansing, Mich., 165 x 200 ft., estimated to cost \$250,000 each, for which bids will be called on a general contract this month. J. N. Churchill, Oakland Building, is architect.

The American Gear Grinder Co., Detroit, recently organized to manufacture grinding machines and parts has arranged for the establishment of a plant at Bellevue Avenue and Benson Street. Albert J. and Conrad L. Ott, formerly connected with the Ott Grinder Co., Indianapolis, head the company.

Copeland Products, Inc., Flint, Mich., recently organized under Delaware laws, has plans for the establishment of a factory to manufacture refrigerators and refrigerating equipment. E. J. Copeland, formerly connected with the Kelvinator Corporation, 2051 West Fort Street, Detroit, heads the new company.

The Paige-Detroit Motor Car Co., Fort and McKinstry Streets, Detroit, has commissioned Albert Kahn, 1000 Marquette Building, architect and engineer, to prepare plans for a one-story addition, to be equipped for assembling.

The Michigan Iron, Land & Lumber Co., Iron Mountain, Mich., is planning the installation of a mechanical conveyor system and coal-handling machinery.

A manual training department will be installed in the new high school to be erected at Novi, Mich., estimated to cost \$135,000. Van Leyen, Keough & Reynolds, 3440 Cass Avenue, Detroit, are architects.

Milwaukee

MILWAUKEE, April 16.

BUILDERS of milling machines are beginning to share in the general improvement in machine-tool demand. Buying is still of a single-lot character, but the broadening source of demand is increasing volume to a gratifying degree. Automotive industries remain the chief purchasers of this class of equipment. Manufacturers of wood-working machinery are booking large orders, and the paper and pulp mill industry in Wisconsin and elsewhere is a large buyer of machinery. Crane business is active and local shops are well booked up and one large interest has found it necessary to increase capacity.

The Bucyrus Co., South Milwaukee, Wis., has contracted with Frank D. Chase, Inc., 645 North Michigan Boulevard, Chicago, to design and erect several additions to the machine shop and general manufacturing plant, which will require a sizable list of miscellaneous tools and machinery for which inquiry is being made. The investment in plant and buildings will be about \$375,000. A dormitory house will also be erected near the works to lodge employees. W. W. Coleman is president and general manager.

The Liberty Foundry Co., Wauwatosa, Wis., which has incorporated its business with \$125,000 capital, will build a brick and steel foundry addition, 80 x 100 ft. at Fifty-seventh and State Streets, estimated to cost \$50,000, including new equipment, most of which has been acquired. The William F. Tubising Co., Wauwatosa, is general contractor. William J. Grede is president and general manager.

The Superior Tool & Die Co., Milwaukee, has been organized with \$20,000 capital stock to manufacture tools, dies, jigs, fixtures, etc. The principals are Edward Biskupski, Benedict Kosmatka and Casimir Janiszewski, 881 Fifth Avenue, employed by local industries, who are establishing their own shop. Most of present needs have been supplied.

The A. Kickbusch Wholesale Grocery Co., Wausau, Wis., is in the market for ice and refrigerating machinery and other equipment, for a warehouse addition. The total investment will be about \$100,000.

The Globe Wire & Iron Works, 1009 Atkinson Avenue, Milwaukee, has increased its capital stock from \$50,000 to \$75,000 to finance purchases of additional equipment and otherwise accommodate the growth of the business. Gustave A. Trepte is president-treasurer and general manager.

Gill Brothers, 214 West Washington Street, Madison, Wis., have engaged Philip Dean, local architect and engineer, to design a public garage and service building estimated to cost \$85,000 complete. It will be tee-shaped, 64 x 264 and 44 x 132 ft., three stories, and require a complete automotive service layout of shop tools and fixtures.

The Ripon Mfg. Co., Ripon, Wis., has been incorporated with a capital stock of \$25,000 to manufacture powder-driven washing machines and other domestic laundry

equipment. An existing plant has been leased and is being renovated. A. C. Brown, A. L. Dombrook and H. C. Brown are the incorporators.

The Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., has plans by L. A. DeGuere, local consulting engineer, for a two-story brick and steel machine shop, 60 x 75 ft., to be added to its hydroelectric and paper mill group at Biron, Wis. John Schnabel, purchasing agent, is inquiring for miscellaneous equipment.

The Quality Aluminum Castings Co., Waukesha, Wis., has been incorporated with \$150,000 capital stock by Alex C. Pankratz, until recently vice-president and works manager Werra Aluminum Foundry Co., Waukesha, and Frank Janke and Percy Charlton, formerly connected with the Werra company. Contracts will be let April 23 for a brick and steel foundry and auxiliary buildings, estimated to cost \$75,000 and to be ready for operation about June 15.

John VanderVaart, 211 Security Building, Sheboygan, Wis., will build a \$50,000 garage, service building and commercial building, 60 x 120 ft., four stories and basement, using the Sheboygan Opera house as a nucleus. Bids will be taken about June 1 by Edward A. Juul, local architect.

The Obenberger Forge Co., Milwaukee, has increased its capital stock from \$250,000 to \$400,000. It is making frequent purchases of additional equipment. The plant and offices are at Fifty-third Avenue and Burnham Street, West Allis.

The Hovland Sheet Metal Works, Inc., Eau Claire, Wis., has been organized with \$25,000 capital stock, taking over an existing shop which will be enlarged and additional machinery provided. A. M. Hovland is the principal owner.

Cincinnati

CINCINNATI, April 16.

WHILE the demand for certain types of machine tools is spotty, the general situation continues to show steady improvement. Local manufacturers who had been getting the larger part of their business from the Middle West state that during the past two weeks the volume of inquiry from the Atlantic seaboard had increased materially and some good orders have been booked. Industrial buying is also showing a wider range. While it was thought that advancing prices would halt buying to some extent, no such effect has yet been noticed. Buying continues to be for one and two machines, though from time to time fair-sized lists come out.

The International Great Northern Railroad has issued an inquiry for 15 machines, including 10 engine lathes. The General Motors Corporation is reported to have bought a large number of used tools, which will be apportioned among the various units of the corporation.

An interesting sidelight on the local machine tool situation was the shipment of five cars of machine tools, including lathes, planers and radial drills, for export to South America and Australia.

The Merchants' Heat & Light Co., Indianapolis, has placed orders with the General Electric Co. for two turbines, and other power house equipment, at a cost of nearly \$1,000,000.

The Tool Steel Gear & Pinion Co., Cincinnati, gear manufacturer, has awarded contract for an addition to its plant which, with equipment, will cost approximately \$20,000.

The Kentucky Clay Products Co., recently organized at Ashland, Ky., has purchased property at Kilgore, near Ashland, and will erect a brick and tile manufacturing plant to cost \$150,000, with equipment.

The manufacture of airplanes will be discontinued by the Dayton-Wright Airplane Co., Dayton, Ohio, June 1. It will, however, continue experimental work in automobile body construction.

The Superior Gas Engine Co., Springfield, Ohio, has awarded contract to the Austin Engineering Co. for a machine shop, 110 x 200 ft., one-story, to be ready for occupancy June 1. Some new equipment will be purchased.

The Bauer Auto Sales Co., Cincinnati, will erect a four-story garage and repair shop, adjoining its present premises on Sixth Street, to cost, with equipment, \$150,000.

The Standard Sanitary Mfg. Co., Louisville, Ky., will expend about \$250,000 on additions to its Louisville plant this year, including the extension of its foundry building and the installation of 10 enameling furnaces. It is also contemplating building a \$2,000,000 plant at Baltimore, to take

care of its Eastern business and export trade. The company is working on a 24-hr. schedule employing 4000 men, the largest number in its history.

The Schreimer-Davis Machine Co., Columbus, Ohio, has been organized to take over the property of the F. W. Schreimer Machine Co., 427 North Park Street, and will conduct a general machine shop business. F. W. Schreimer is president and J. E. Davis general manager and secretary.

W. W. Wilson & Son, Washington Court House, Ohio, are in the market for a bale tie machine and a wire straightener.

Construction of an addition to the machine shop at the plant of the Superior Gas Engine Co., Springfield, Ohio, has been started by the Austin Co., Cleveland, which has been awarded the general contract. The building will be 110 x 200 ft. The addition is needed to meet the increasing requirements of the company. A new office building, 58 x 158 ft., two stories and basement, is nearing completion at the gas engine plant. P. J. Shouvin is president.

The Gulf States

BIRMINGHAM, April 16.

TENTATIVE plans are being prepared by the Southwestern Portland Cement Co., El Paso, Tex., for a new plant on property recently acquired near Fort Worth, Tex. It will include a power house and machine shop and will cost in excess of \$450,000.

The Western Public Service Co., Hempstead, Tex., has acquired the local plant and system of the Hempstead Light & Power Co., and contemplates extensions and the installation of additional machinery. Paul Freeman is division superintendent in charge.

The Birmingham Ice & Cold Storage Co., Avenue E and Twenty-second Street, Birmingham, will commence the erection of a seven-story and basement addition to its ice-manufacturing and cold storage plant, to cost close to \$400,000 with machinery.

The Canal Lumber Co., Richton, Miss., is considering rebuilding the portion of its mill and power house destroyed by fire April 7 with loss estimated at \$55,000.

The Alabama Power Co., Birmingham, has acquired the plants and systems of the Montgomery Light & Water Power Co., Montgomery Light & Traction Co., the Power Transmission Co., and the People's Electric Light & Ice Co., all operating at Montgomery, Ala., and vicinity. Extensions and improvements will be made and additional equipment installed. To carry out the project, the purchasing company is disposing of a bond issue of \$4,000,000.

J. W. Davis, 2810 Elm Street, Dallas, Tex., is planning for the installation of punch press, about 25 to 30 tons capacity, and a milling machine.

Sutton, Steele & Steele, Inc., Dallas, Tex., manufacturer of ore-concentrating machinery and parts, has purchased about 1½ acres on Forney Avenue. Work will commence at once on a new mill, to be used primarily for the production of steel and steel-alloy, malleable and gray iron castings. An electric furnace, motors, casting and finishing machinery will be installed. It is expected to have the plant ready for operation in three months. It will cost \$125,000.

A manual training department will be installed in the new three-story high school to be erected at Greenville, Tex., estimated to cost \$125,000. Lindsey & Kilmer, Greenville, are architects.

Fire, April 3, destroyed the plant of the Birmingham-Packard Motor Car Co., Birmingham, with loss estimated at \$325,000, including equipment and stock. It is planned to rebuild.

The Daytona Public Service Co., Daytona, Fla., is contemplating the installation of additional equipment at its power plant, including two 300-hp. boilers, pumps, air compressors and auxiliary machinery. The company is operated by the Gas & Electric Improvement Co., 77 Franklin Street, Boston, which will award contracts.

The Goethe Lumber Co., Manning, Fla., is in the market for a 30-ton industrial locomotive, standard gage.

The Halifax Rock Co., Daytona, Fla., will soon take bids for a saddle back locomotive for rock mining operations.

The Texas Portland Cement Co., Dallas, Tex., will enlarge its mill near Manchester, Tex. Considerable machinery will be installed, including power and operating equipment, to cost approximately \$50,000.

A manual training department will be installed in the new high school to be erected at Olney, Tex., estimated to cost \$85,000. An architect will soon be selected.

The International & Great Northern Railroad Co., Mason Building, Houston, Tex., has preliminary plans for new

locomotive and car repair shops, estimated to cost \$250,000 with machinery. F. S. Schwinn is chief engineer.

The Amalgamated Seaport Petroleum Co., New Orleans, recently organized with a capital of \$25,000,000, is considering plans for a large refinery on property on the west side of the Mississippi River, near the city limits, to cost about \$1,500,000. A power house and machine shop will be included.

In connection with the new high school now being constructed at Cisco, Tex., estimated to cost \$250,000, it is planned to arrange one entire section as a vocational department. A list of machinery will soon be arranged. J. J. Godbey is superintendent of local schools.

The Arkansas Light & Power Co., Pine Bluff, Ark., is planning for extensions in the plant and system of the Jackson Public Service Co., Jackson, Miss., recently acquired. It has also taken over the Vicksburg Light & Traction Co., Vicksburg, Miss., and will extend the plant. Additional machinery will be installed. A. G. Whidden is general manager of the Arkansas company.

A manual training department will be installed in the new junior high school to be erected at Tyler, Tex., estimated to cost \$200,000, for which bids on a general contract will soon be asked. DeWitt & Lemon, Dallas, Tex., are architects.

The Tampa Forwarding Co., Tampa, Fla., is in the market for conveying equipment, factory trucks, etc.

Indiana

INDIANAPOLIS, April 16.

PLANs are being prepared by the Esterline-Agnus Co., 227 East South Street, Indianapolis, manufacturer of electrical equipment, for a new two-story plant estimated to cost \$75,000.

The Adams Plating Co., Indianapolis, will establish a new metal-working plant at 138 West Tenth Street. The present works will be removed to this location.

The Midwest Engine Corporation, Martindale Avenue and Nineteenth Street, Indianapolis, will remodel a portion of its plant for a repair department for locomotives and cars. Two large buildings erected during the war for marine turbine manufacture will be used and new machinery installed. The expansion will cost about \$100,000. Improvements will also be made in the foundry department, and one of the present buildings arranged as a general jobbing plant for casting production. H. C. May is president.

The H. T. Electric Service Co., Indianapolis, care of Edward D. Pierre, 321 Occidental Building, architect, has plans for a one and two-story factory, 55 x 195 ft., estimated to cost \$30,000.

The Chicago & Eastern Illinois Railroad Co., 332 South Michigan Avenue, Chicago, has plans for new locomotive and repair shops at Evansville, Ind., using a portion of the present yards at Main and Eighth Streets. The new plant is estimated to cost more than \$1,000,000.

The Indianapolis Light & Heat Co., Indianapolis, will install additional machinery at its power plants on Mill Street and Kentucky Avenue, to cost approximately \$500,000 each.

The B. & C. Planing Mill Co., Indianapolis, has commenced the erection of a new plant at Moore and Christian Streets, and will soon arrange a list of machinery. All equipment will be electrically-operated. Roy E. Castetter is one of the heads of the company.

The Chapman-Price Steel Co., Troy Avenue, Indianapolis, will commence the erection of a one-story addition, 100 x 150 ft., for the manufacture of metal tanks, washing machines, etc. It will also build another addition to the main plant, 80 x 85 ft., to be used for metal roofing and other steel product manufacture. The expansion will cost about \$100,000. Niles Chapman is president.

The Blackford Window Glass Co., Vincennes, Ind., will commence the construction of a new plant, estimated to cost \$1,000,000 with machinery. A power house will be built and a machine shop installed.

The Clinton Coal Co., Clinton, Ind., will build a steel tippie at its properties, to cost \$85,000.

The Puritan Bed Springs Co., 902-20 Kentucky Avenue, Indianapolis, will rebuild the portion of its enameling department destroyed by fire April 14. An official estimate of loss has not been made. New ovens and other equipment will be installed.

The Board of Sanitary Commissioners, City Hall, Indianapolis, will take bids until April 24 for equipment for a new municipal sewerage disposal plant, including traveling crane, stokers, coal storage and handling machinery, fans and motors, conveying machinery, screens and other mechanical apparatus. Charles H. Hurd, Merchants Bank Building, is consulting engineer. J. A. Craven is president of the board.

The Central South

ST. LOUIS, April 16.

THE Wabash Railway, St. Louis, has purchased the following equipment for its machine shops at Decatur, Ill.:

- One single operator portable electric welder.
- One Oster No. 304-B pipe threading machine.
- Five Oster No. 300-B pipe threading machines.
- One PS&W XC-36 gap shear.
- One Stilwell open-type feed water heater, 250-hp.
- One 13 x 8 x 10 Laidlaw duplex 2-stage air compressor.
- One 6 x 4 x 6 duplex feed water pump.
- Three No. 4 combined locomotive feed water heaters and boiler feed pumps.
- Three Wallace 6-in. bench jointers.
- One O'Neill rapid flue welder, 2 in. to 6 in.
- Six Red Devil rivet cutters.
- One Mahr No. 5-A paint burning torch.
- Three Mahr No. 1-C Portable torches.
- Six Mahr No. 18 fuel oil rivet forges.
- One paint spraying outfit.
- One Niagara No. 135 power punch.
- One NBP combination journal turning and axle lathe.
- Nine 18-in. x 9-ft. engine lathes.
- Twenty-two 50-ton Duff No. 5026 jacks.
- Eighteen 25-ton Duff No. 29 jacks.
- Eighty-six 15-ton Duff No. 519 jacks.
- Ten No. 1028 Duff push and pull jacks.
- Thirty-six No. 152-B 25-ton Joyce-Cridland journal jacks.
- Four No. 5360-B Norton jacks.
- One close quarter reversible piston air drill No. 19.
- Two close quarter air drills No. 19.
- Twenty-two No. 61 Thor wood boring machines.
- Ten No. 3 Thor non-reversible air drills.
- Other tools will be purchased this week.

Work will begin shortly on a new plant, 60 x 100 ft., for the Tymo Utility Co., Paducah, Ky., recently organized with a capital of \$100,000, for the manufacture of furnaces and parts, used for tobacco firing and estimated to cost \$40,000. R. H. Scott is president, and Howard Shelton, secretary and treasurer.

The Pure Oil Co., Pure Oil Building, Columbus, Ohio, will build an addition to its refinery at Ardmore, Okla., to cost about \$250,000, including equipment.

A manual training department will be installed in the new two-story high school to be erected at Wellston, Mo., estimated to cost \$150,000, for which bids on a general contract will be received until April 25. Kneland, Gieseler & Meles, De Menil Building, St. Louis, are architects.

The Duncan Machinery Co., P. O. Box 265, Knoxville, Tenn., is in the market for boilers, 75, 80 and 100 hp., operating at 125 lb. pressure, Scotch marine or similar type.

The Oklahoma Gas & Electric Co., Oklahoma City, Okla., has acquired the municipal power plant at Muldrow, Okla., and will remodel the station for central service and install additional equipment.

The Pioneer Petroleum Co., Guthrie, Okla., is remodeling its oil refinery, recently acquired from the Carbo Refining Co. Additional equipment will be installed. Plans for a new pipe line, with pumping plant, are under consideration.

The Crane Enamelware Co., Chattanooga, Tenn., a subsidiary of the Crane Co., Chicago, has awarded contract to the Austin Co., Cleveland, for an addition to cost in excess of \$200,000, with machinery.

A manual training department will be installed in the new three-story high school to be erected at Dexter, Mo., estimated to cost \$100,000, for which bids will soon be asked. J. H. Felt & Co., Grand Temple Building, Kansas City, Mo., are architects.

The Schoeb Motor Co., Augusta, Kan., has inquiries out for a lathe, drill press and other equipment.

The Consumers Ice Co., Tulsa, Okla., recently organized with a capital of \$100,000, will commence the erection of a new ice-manufacturing plant near Sand Springs, Okla., 35 x 195 ft., with electric power station, estimated to cost \$70,000 with machinery. Paul M. Gallaway is president and general manager.

Gullis & Davidson, 201 North Main Street, Wichita, Kan., are in the market for a hand power press and tinner's brake.

The Farmers' Blacksmith Shop, Sedgwick, Kan., will install a lathe, cylinder boring machine, bench tools and transmission equipment for a machine and repair shop. R. McAfee is head.

The Ashland Clay Products Co., Ashland, Ky., is planning the erection of new works to manufacture brick and

the products, estimated to cost \$150,000 with machinery. A power house and machine shop will be included. W. B. Elswick is president.

The Oklahoma General Power Co., Muskogee, Okla., has arranged an appropriation of \$3,000,000 for the construction of its new generating plant, foundations for which are in progress. The installation will include six 100-hp. boilers, one 20,000-kw. and one 10,000-kw. generator, and auxiliary machinery.

The Rockwood Stove Works, Inc., Rockwood, Tenn., has awarded contract to B. F. Adams, Knoxville, Tenn., for a one-story foundry, 100 x 125 ft., adjoining the present plant. Harry Howard is manager.

The Sinclair Refining Co., 111 West Washington Street, Chicago, has construction in progress on a new refinery on about 100 acres near Kansas City, Kan., recently acquired. It will include a power plant and machine shop and is estimated to cost \$500,000.

The Roxana Petroleum Co., Tulsa, Okla., has acquired 200 acres near Wichita, Kan., as a site for a new refinery, estimated to cost \$3,500,000 with machinery.

The Atchison, Topeka & Santa Fe Railway Co., 80 East Jackson Boulevard, Chicago, has acquired over 300 acres at Kansas City, Kan., and proposes to use the site for new locomotive and car shops, plans for which will soon be prepared. The cost will be \$250,000.

A manual training department will be installed in the new two-story high school to be erected at Aurora, Mo., estimated to cost \$100,000, for which bids are being received on a general contract. Earl Hawkins & Co., 400 McDaniel Building, Springfield, Mo., are architects.

The Tennessee Electric Power Co., Chattanooga, Tenn., has arranged an appropriation of \$18,000,000 for extensions in its hydroelectric power plant at Great Falls, to include the installation of machinery to more than double the present output.

The Memphis Power & Light Co., Memphis, Tenn., has decided upon an appropriation of \$3,400,000 for extensions and improvements in its generating plants and system during the year, including the installation of new machinery.

The Pacific Coast

SAN FRANCISCO, April 11.

PLANS have been completed for the erection of a new one-story factory for the Federal Tank & Pipe Co., Seattle, Wash., and bids will be called at once. It will cost about \$35,000. Stoddard & Son, Lyon Building, are architects and engineers.

The National Ice & Cold Storage Co., Santa Rosa, Cal., will commence the erection of a one-story addition to its ice-manufacturing plant, estimated to cost \$60,000. J. B. Howe, Postal Telegraph Building, San Francisco, is engineer.

The Snowlene Refining Co., Pacific Mutual Building, Los Angeles, is negotiating for a site at Riverside, Cal., for the erection of a new oil refinery estimated to cost \$300,000 with machinery, which will include a power house and one-story machine shop. F. E. Snowden heads the company.

The Spokane Refining Co., Old National Bank Building, Spokane, Wash., J. P. Graves, head, is planning the erection of a new oil refinery, estimated to cost about \$200,000 with machinery. The plant will include a power house.

The Great Western Power Co., 14 Sansom Street, San Francisco, is arranging a fund of \$4,000,000 to be expended during the next 24 months for additions in its hydroelectric generating plants on the Feather River, including steel tower transmission lines.

The Northwestern Electric Co., Pittock Building, Portland, Ore., has plans for a new one-story machine and repair shop to cost \$35,000.

The Seaside Refinery Co., Ventura, Cal., has acquired local property and plans the construction of a new oil refinery estimated to cost \$100,000 with machinery.

A manual training department will be installed in the new Excelsior high school to be erected at Norwalk, Cal., comprising a group of buildings, with vocational shop, 104 x 138 ft., estimated to cost \$300,000. Theodore C. Kistner, 428 Spurgeon Building, Santa Ana, Cal., is architect.

Power and conveying machinery, motors and other equipment will be installed in the plant to be erected by the Union Lithograph Co., 2030-42 East Seventh Street, Los Angeles, to replace its factory destroyed by fire March 29, with lost estimated at \$300,000, including machinery.

The Columbia River Paper Mills Corporation, Vancouver, Wash., has awarded contract to the Gilpin Construction Co., Portland, Ore., for the first unit of its proposed works, estimated to cost \$200,000. A power plant and machine shop will be built later. With other units, the entire plant will cost \$1,200,000.

The Electric Metals Co., San Francisco, care of Sander-son & Porter, Nevada Bank Building, consulting engineers, has preliminary plans for a new hydroelectric generating plant on the Klamath River, Siskiyou County, near the site of its proposed metal plant, with capacity of 110,000 hp., estimated to cost \$1,000,000. The metal works will consist of a complete mining and metallurgical plant, to cost approximately \$4,000,000 with machinery. Plans for the latter are also in progress.

The Utica Mining Co., 575 Mills Building, San Francisco, will build and operate a hydroelectric power plant on Highland Creek, Tuolumne County, to cost about \$150,000.

Canada

TORONTO, April 16.

DEMAND for machine tools continues to show steady improvement and business closed so far this month is well up to the volume booked the first two weeks in March. The general call for all classes of equipment has resulted in increased operations among manufacturers producing machinery, and while many are operating to capacity others are doing considerable overtime work and are still behind in shipments. An interesting feature of the present market is that the greater part of the demand is for new lines rather than for rebuilt and second-hand tools. Good bookings are also reported for small tools and accessories.

J. N. Coupal, Casselman, Ont., contemplates remodeling an electric plant and will require new turbines.

L. J. Menard, St. Michel des Saints, Que., will install an electric system in a sawmill and is asking for prices on turbines and generator.

The Dominion Coal Co., Glace Bay, N. S., will purchase locomotive boilers at a cost of \$6,000. D. Hine, care Dominion Steel Corporation, Sydney, N. S., is purchasing agent.

The Port Colborne Foundry Co., Port Colborne, Ont., will install a 7-ton traveling crane and will call for bids at an early date. O. Alair is secretary.

O. & W. McVean, Ltd., Dresden, Ont., is in the market for a motor, complete with starting box, 25-cycle, 5 or 7½ hp., 750 r.p.m., three-phase, 550 volts.

The British Empire Steel Corporation, Montreal, Que., is spending \$30,000 on enlargements and additional equipment for an electric plant at New Waterford, N. S. It will also install an electrically operated belt conveyor, 75 ft. long, and an endless haulage wire for handling coal cars at North Sydney, N. S.

Elmira, Ont., will spend \$16,000 on extension to the waterworks plant, in which new motor pumps will be installed, etc. J. H. Ruppel is clerk.

Gauthier & Julien, Ltd., Portneuf Station, Que., will erect a foundry at a cost of \$10,000. Equipment will be purchased by A. Gauthier.

J. A. Doige, 261 Ottawa Street North, Hamilton, Ont., will erect a plant for the manufacture of concrete blocks, etc.

The Bridge River Power Co., Seton, B. C., is having plans prepared for a power development project to cost \$12,000,000, including gravity dam, power house and transmission line. H. Holgate is engineer.

The Engineering & Radio Supplies, Ltd., Orangeville, Ont., has taken over the plant of the Cataract Electric Co. and the Industrial Engineering Co. of Canada, and proposes to build an addition to the plant of the Cataract company at Cataract, Ont., and increase production from 800 to 3000 hp. R. G. Lee is president.

The Bell Telephone Co. of Canada will spend \$13,000,000 on new plants and equipment in Toronto and Montreal. A new building will be erected on Ontario Street, Montreal, to cost, including equipment, \$4,000,000.

The Barnes Mfg. Co., Detroit, manufacturer of scales, etc., has leased a building at 325 Assumption Street, Windsor, Ont., which will be equipped for an assembling plant. It is the intention to manufacture the complete product in Canada at a later date.

The Town Council, Clifford, Ont., proposes to erect an electric light plant and is interested in prices on equipment.

The West Kootenay Power Co., West Kootenay, B. C., has made application to double the capacity of its main power plant at Bonington Falls, on the Kootenay River.

The Kissel Motor Car Co. of Canada, has acquired the building formerly occupied by the Midland Woodworkers, Ltd., Midland, Ont., and will soon start work on the manufacture of automobiles and trucks. The plant has a fully equipped woodworking and machinery shop.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.54c.
Swedish bars, base price	7.50c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees	
3 in. x ¼ in. and larger, base	3.64c.
Channels, angles and tees under 3 in.	
x ¼ in., base	3.54c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.80c.
Toe-calk, ½ x ¾ in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth spring-steel	4.70c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.40c.
Squares, flats and hex.	4.90c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High speed steel, 18 per cent tungsten	75c. to 80c.

Tank Plates—Steel

¾ in. and heavier	3.64c.
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Sheets

Blue Annealed

	Per Lb.
No. 10	4.59c.
No. 12	4.64c.
No. 14	4.69c.
No. 16	4.79c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.90c. to 5.30c.	.....
Nos. 22 and 24	4.95c. to 5.35c.	5.60c.
No. 26	5.00c. to 5.15c.	5.65c.
No. 28	5.10c. to 5.50c.	5.75c.
No. 30	5.30c. to 5.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	5.20c. to 5.60c.
No. 16	5.35c. to 5.75c.
Nos. 18 and 20	5.50c. to 5.90c.
Nos. 22 and 24	5.65c. to 5.95c.
No. 26	5.80c. to 6.20c.
No. 27	5.95c. to 6.35c.
No. 28	6.10c. to 6.50c.
No. 30	6.60c. to 7.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel			Wrought Iron		
	Black	Galv.		Black	Galv.
½ in. Butt...	—47	—31	½ in. Butt...	—4	+19
¾ in. Butt...	—52	—39	¾ in. Butt...	—11	+9
1-3 in. Butt...	—54	—41	1-1½ in. Butt	—14	+6
2½-6 in. Lap.	—50	—37	2 in. Lap....	—5	+14
7-8 in. Lap...	—47	—20	2½-6 in. Lap.	—9	+9
9-12 in. Lap..	—42	—18	7-12 in. Lap..	—3	+16

Steel Wire

	Per Lb.
Bright basic	5.00c.
Annealed soft	5.00c.
Galvanized annealed	5.65c.
Coppered basic	5.65c.
Tinned soft Bessemer	6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	21¾c. to 227c.
High brass wire	22¾c. to 23¾c.
Brass rods	19¾c. to 20¾c.
Brass tube, brazed	28¾c. to 297c.
Brass tube, seamless	25¾c. to 26¾c.
Copper tube, seamless	27¾c. to 28 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 25½c. to 26½c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates

Bright Tin	Grade	Grade	Coke—14-20	Prime	Wasters
	"AAA"	"A"			
	Charcoal	Charcoal			
	14x20	14x20			
IC..	\$11.00	\$9.75	80 lb..	\$6.30	\$6.05
IX..	12.25	11.00	90 lb..	6.40	6.15
IXX..	13.50	12.25	100 lb..	6.50	6.25
IXXX..	14.75	13.50	IC..	6.65	6.40
IXXXX..	16.50	14.75	IX..	7.65	7.40
			IXX..	8.65	8.40
			IXXX..	9.65	9.40
			IXXXX..	10.65	10.40

Terne Plates

	8-lb. coating, 14 x 20	
100 lb.		\$7.00
IC		7.25
IX		7.50
Fire door stock		9.00

Tin

Straits pig	50c.
Bar	57c. to 62c.

Copper

Lake ingot	19 c.
Electrolytic	18½c.
Casting	18¼c.

Spelter and Sheet Zinc

Western spelter	9¼c.
Sheet zinc, No. 9 base, casks	11c. open 11½c.

Lead and Solder*

American pig lead	9¼c. to 9¾c.
Bar lead	12¼c. to 14c.
Solder, ½ and ½ guaranteed	33c.
No. 1 solder	31c.
Refined solder	28c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	10c. to 11c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	30c. to 31c.
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Old Metals

Business is very quiet and values are a little off. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	14.25
Copper, heavy wire	13.75
Copper, light and bottoms	11.75
Brass, heavy	8.00
Brass, light	6.50
Heavy machine composition	11.50
No. 1 yellow brass turnings	8.25
No. 1 red brass or composition turnings	10.50
Lead, heavy	7.25
Lead, tea	5.25
Zinc	4.75